Travel

SEPTEMBER 1946

35 CENTS

PRELUDE TO KOREAN INDEPENDENCE

by Younghill Kang

THE BLACK GOLD OF RUSSIA

by Albert Parry

SKY PLANTING IN THE DESERT

by Murrelle Mahoney

THE GLORY OF ANCIENT INDIAN ARCHITECTURE

by E. O. Hoppé

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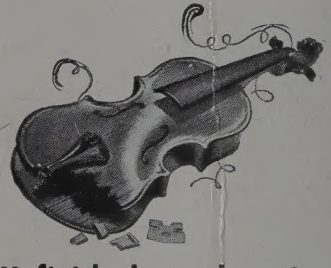

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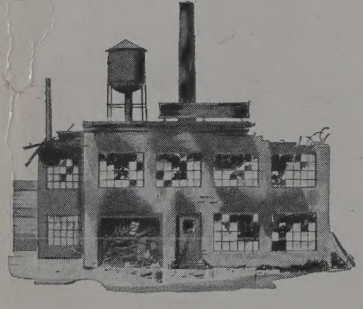

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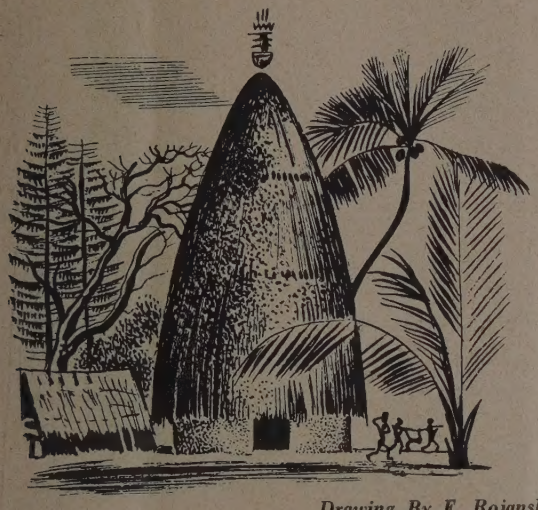

Drawing By F. Rojansky

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The thrilling story of modern medicine and its remarkable achievements told by more than thirty distinguished doctors, surgeons and scientists.

NEW WORLDS IN MEDICINE

EDITED BY HAROLD WARD

This is the story of modern medicine in peace and at war. It is the drama of the great Art of Healing as we have come to know it in our day, and as it is told for us by more than thirty of the country's leading men of medicine and science. Above all, it is a many-sided record of human courage, patience, resourcefulness, and achievement in extending the frontier of man's conquest of nature in her least admirable forms of pain, suffering, degeneration and disease.

You may read here how the clinical pathologist works anonymously to save lives; how the physicist, with X-rays and cyclotrons, has provided the doctor with powerful new weapons; of the new triumphs in bacteriology, surgery, endocrinology, nutrition, and psychiatry. The sober yet dramatic writings of men like Logan Clendening, E. E. Hume, Perrin H. Long, Iago Galdston, Oscar Riddle, L. F. Barker, A. J. Carlson, R. W. Gerrard, B. J. Stern, H. E. Sigerist, and many others, describe for us medical accomplishments ranging from the virus and vitamins to the improvement in public health. Conspicuous in the dramatic panorama are such grim problems as cancer, old age, epidemics, and mental disease, while like an undertone of artillery, come the stories of medicine in World War II—on land, at sea, and in the air.

Stirring though their narratives may be in and of themselves, they are even more significant because of the growing emphasis they place upon the physician's obligation to society at large. For doctors, too, are increasingly the relentless enemies of the condition out of which come war, poverty, insecurity, and reaction. In this book, each, after his own fashion, tries to tell how the great ideals of Hippocrates in the 5th Century before Christ, are faring in the 20th.

Harold Ward was the editor of *New Worlds in Science,* and in addition is a frequent contributor to magazines on scientific subjects. He is a member of the American Association of the History of Medicine and of the History of Science Society. Introduction. Special notes and index. 707 pages. $5.00.

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SEPTEMBER, 1946

Travel

VOL. 87, NO. 5

THE ANTIDOTE TO DROUGHT

Months of drought often reduce the water holes on the Papago range to mud caked craters. What could be done by planting specially selected seeds is indicated by these two pictures. The observation plot above was set out by government experts a year ago.

SKY PLANTING IN THE DESERT

by Murrelle Mahoney

Photographs from Western Ways

ON THE ARID DESERT of the Papago Indian Reservation at Sells, Arizona, tests are going forward which should be of vital significance to the whole world. Appropriately one of America's first agricultural peoples, wandering farmers at the time of the conquistadors, are the first to benefit by aerial seeding, modern science's newest method of farming.

As the Papagos look on, an airplane flies over their lands spraying eighty acres a minute with millions of regularly spaced, tiny earthen seed bombs. At the first touch of rainfall, these bombs will explode into sturdy

WATCHING THE SKY-PLANTER AT WORK

Papago Indians follow the sky-planter with eager eyes as it makes experimental flights. On the opposite page an Indian holds a signal flag to guide the plane across the once rich, grassy range land which has been completely taken over by cacti and other desert plants. At the right, other Indians observe a trial run over a water storage reservoir to test the proper spreading of pellets by watching them fall on the surface of the water.

stalks of the imported Lehmanns Lovegrass.

This aerial planting method, which makes use of a dirt pellet developed by Dr. L. S. Adams, retired surgeon turned inventor, holds out a light of hope in the dark picture of world famine today.

Countries such as France, China and Russia could be revegetized from the air with a saving of weeks, perhaps months, in precious time. Thousands of acres could be covered with grain or grass seed in the vast agricultural lands of Canada, Argentina and Brazil.

Where shortage of manpower is critical, as in Germany and other countries, a crew of a dozen or so men, including pilot, agricultural adviser and men to work the simple pelletizing machinery, could accomplish in a matter of days what it would take hundreds of individual farmers weeks of hard work to equal. Easily convertible miiltary planes, standing idle in many parts of the globe, under the supervision of American experts, would bring the benefits of this rapid planting method to the entire world.

Aerial sowing has proven feasible for the first time by the simple expedient of adding weight to the seed, which, in earlier experiments, proved too light to allow even distribution, floating lazily down on air currents, heavily overseeding in spots and missing others completely.

Scientific dirt pellets are sprayed out of a spoked, rotary disseminator beneath the aircraft, which whirls centrifugally by motor or by wind action against vanes on its rim. They can be regulated to fall as thickly as desired, and in a sufficiently regular pattern, by varying the flying speed or altitude of the plane, or changing the number of wind vanes on the seeder.

No bigger than a green pea, the little shell of earth contains moisture, fertilizer and chemical pest repellents, protecting the seed from drying up, or from being eaten by birds or carried away by ants. It will lie dormant indefinitely, awaiting the first rainfall to sprout into hardy stalks of grass. In Arizona this drought resisting quality is all important. The Papago Reservation, home of the Indians for many centuries, receives a scant ten inches of rainfall a year.

But eventually, of course, it will rain—and when it does, the seed, husked before the pelletizing treatment, will sprout in twenty-four to forty-eight hours, utilizing later rains to promote growth of the seedling. On the other hand ordinary seed sometimes takes four to twelve weeks to part the desert soil and start growing.

The pelletizing machinery is simple and portable, and can be adapted for use in any section of the country. It is set up on two truck beds, and operated by truck motors. The pellets are produced rapidly and in quantity on the planting site itself, slicing still more precious minutes off the time factor.

The processing consists of a few elemental steps. Natural soil of the area to be planted is first powdered fine by a hammer-mill. From hoppers it is fed into a trough with a rotary mixing blade, and moisture and insect-rodent repellent are sprayed in through jet nozzles. The husked seed, dusted with fungiscide, is dropped into this damp powder through a fine slot which allows three to seven seeds to cluster in each little sphere.

The last ingredient is powdered fertilizer, which is easily added and eliminates the labor and expense of this separate operation after planting. The completed preparation is dumped into a funnel shaped machine, cut at the bottom by four revolving, notched discs, which meet and press out the rock like little mud balls in a rapid patter. Each pellet is a complete scientific package, ready for planting.

To speed up the loading process, a small farm type tractor was fitted with a hydraulic lift, provided with a special extension yoke and a hopper which holds the same amount of pellets as the plane's hopper.

Pellets from a stockpile produced on the planting site are loaded into a hopper. The amount of acreage planted each day is directly controlled by the capacity of the plane, the distance of the improvised landing strip from the acreage to be planted, and the time of loading the pellets into the plane.

The pellet was a direct steal from Mother Nature. It was while operating a ranch in southern California in 1927 that Dr. Adams became alarmed over the swift spread of soil erosion, and set to work on a method of combating it. Dr. Adams had a life long record of contributions to aviation, and quite naturally turned to the airplane as the only planting means fast enough to keep pace with the spreading plague.

Searching for a means of adding weight to the seed, the Doctor observed an abundance of prickly pear during a dry year when other vegetation was sparse. With the curiosity of the scientist he investigated, and found quantities of rabbit droppings near the plants. The seed of the fruit, preserved in the droppings of seasons before, had survived to germinate, while other seed had been eaten by birds or

RELEASING THE SEEDS

Dr. Adams' aerial seeder is wind and power operated. It flies at an average altitude of five hundred feet and with ideal flying conditions, from a landing strip near the scene of planting, two thousand acres can be seeded in an average day. Larger planes, of course, would be able to plant much larger areas.

insects, had dried up or been carried away on the winds and lost.

Chemical companies had tried unsuccessfully to make synthetic pellets. Dr. Adams felt that natural dirt was the proper medium. It would lend weight and protection at once. It would dissolve at the first touch of rain, and allow the seed to sprout inside its own little sphere of earth, enriched with every possible aid to growth. Today the pellet is rapidly becoming recognized as one of the most scientific and protective means of treating seed to insure high germination. In observational test plantings, as high as ninety-nine per cent germination has been achieved.

In the experiments at Sells, a hopper load of pellets at a time is lifted hydraulically, on an extension yoke fitted to a tractor, and poured into the hopper inside the plane. A payload is about one thousand pounds, and the loading operation is so fast that it is performed between flights, while the plane's propellers are still whirling.

The plane, a converted twin-engine Cessna, formerly used to train American lads the technique of sowing bombs over Europe, was chosen for good lift, low wing loading, and maneuverability at low altitudes and speeds.

To aid in distribution the doctor invented the special centrifugal seeder to be attached to the belly of the aircraft. Pellets from the hopper drop into its spokes, which, whirling at a uniform speed, fling out pellets in a well spaced pattern. The spheres are calculated to fall approximately one per square foot. Each flight sows a whole acre in less than a second, covering a swath one thousand feet wide.

Repeated test flights were made over a small pond on the desert, near Sells. At first Pilot A. R. Brown, veteran of many raids over Europe, skimmed over the water at only four hundred feet, trailing a dusty brown wake which quickly disintegrated into falling pellets. They splashed like hailstones in a strip four hundred feet wide, and peppered a blanket on the shore several times thicker than necessary. In subsequent tests, the swath was widened and the distribution thinned out by higher speeds and altitudes.

The planting progresses at the rate of one flight per minute, with a payload covering eighty acres. A maximum of two hundred acres per trip could be sown from a larger plane, with high speeds and altitudes.

In a few weeks time, if Nature does her part, the desert should be green with waving stalks of grass. If the planting must be done during the season when rainfall is at a minimum, Dr. Adams has a small explosive pellet which pocks the ground, opening millions of minute craters.

"With these I can prepare the soil just before the season when infrequent rains occur, and store moisture until it is sufficient for planting," he explains.

The best results from reseeding are obtained when control of the grazing area is possible. Since the Papagos have enough range land to keep their cattle off the seeded ground, the grass has a chance to germinate, take firm hold, flower and reseed itself for the next season. If it could be allowed to lie idle for three years, replanting would never be necessary.

But even without control of the grazing area, the grass cover can be replenished by replantings once every two or three years. In this way, the private rancher or agriculturist could operate on much less land than he would need for proper rotation of his grazing herd or crops. With the westward movement of civilization and fewer frontiers remaining, continual use of land becomes more necessary, and revegetizing more essential.

In addition to broadcast sowing of grass lands, pelletizing promises to be a revolutionary method for planting of row crops. Many kinds of vegetable seed too small for use in ordinary hand seeders could be brought up to the desired size by encrusting them in dirt pellets. Dr. Adams predicts that small plants will be set up all over the country for processing vegetable and even flower seed.

Besides its use for range and row crop planting, the pellet is also adaptable for reforestation purposes. Aerial planting on inaccessible rough mountain slopes, in the forests of the Northwest, would be much swifter than ground planting of trees.

To give it still more weight and momentum, the pellet is encased in a metal cap, open at one end. The disseminator is turned to a vertical position, and the little bullets hurtle to the ground with enough force to drive through pine needles, or other mulch covering, and embed themselves in the earth.

After the tremendous slashes into our tim-

PRELIMINARY PLANTING

Sky-planting requires carefully scheduled and coordinated planning between ground and air crews. Here Dr. Adams is conferring with a former officer of the U. S. Army Air Corps prior to the initial take-off on the first, history-making flight to bring new life to the Western range.

INDIAN HOCKEY

During recreation periods Papago girls at school play the ancient tribal game of *taka*. It resembles hockey and the "sheeny" of the Great Lakes Indians. The ball is made of two cow vertebrae tied with a thong.

The Papago rodeo opens with a grand parade of all the contestants. Their enthusiasm for the rodeo is an indication of their interest in the live stock industry.

ber reserves to keep up our war effort, thousands of acres of forests in the Northwest are in vital need of replenishing. According to the present views of many conservation experts, restoring trees is the best means of stopping erosion in the watershed of rivers. Millions of dollars have been spent to build flood control dams in the United States, and today these dams are filling with silt, irreplaceable topsoil washed down year by year, from the lands along the headwaters. Dredging the dams is almost as expensive as building new ones, and all the while the erosion goes on. If this money had been invested in replacing timber, which would hold the precious soil in place, the problem might have been solved at the source.

To seed growers and dealers, the pelletizing system may mean widespread and revolutionary changes in processing methods. Emphasis is on the high quality of seed and the high percentage of germination. This trims down the waste factor, reducing the quantity of seed which needs to be handled and resulting in savings to the farmer.

For returning servicemen, aerial planting opens a bright vista of thousands of possible jobs. If seed processing plants are set up in various sections of the country, as Dr. Adams is confident they will be, men of many skills will be required. Agricultural experts will be needed to advise on rainfall, soil and weather conditions, and the types of seed best adapted for the requirements of each planting area. Specialists in planting wheat or rice or hay, for example, would be of value in the huge grain belts of the Midwest and Southwest. Laborers are needed to man the pelletizing machinery, load the hoppers, and operate the tractor for loading the pellets into the ship.

Pilots with varied types of training and backgrounds would be in demand. Flying conditions, topography and inaccessibility of terrain in rough mountain country to be reforested will demand widely different flying skills from those needed on the rolling prairies of the grain belts, or over flat hot desert country.

Since the practical payload is limited by the carrying capacity of the aircraft, and the weight of the pellets cannot be reduced, short runs, with frequent landings for reloading, are necessary. The resulting fatigue means

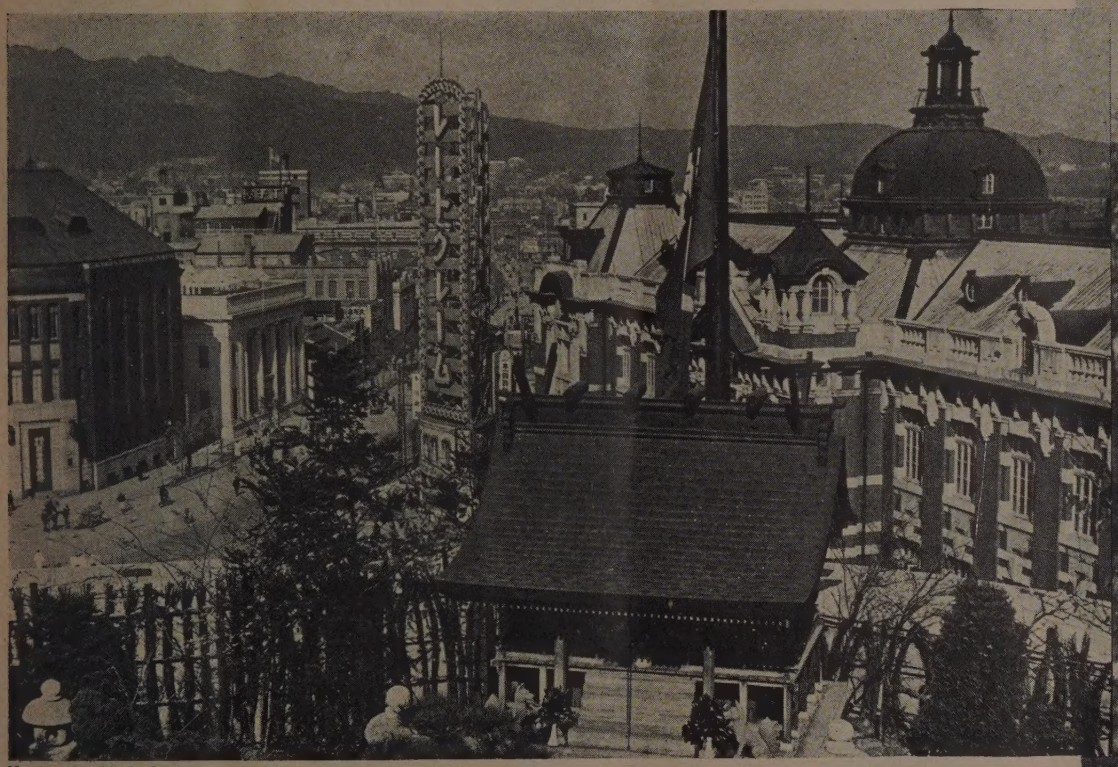
(Continued on page 30)

AT THE RODEO

Papago children enjoy the rodeo enormously as well as the candy apples and barbecue which are an important part of the occasion. The Papagos are improving their homes as fast as their slender resources will allow. They are sending their children to school and they are eager to learn better methods of farming.

PRELUDE TO KOREAN INDEPENDENCE

by Younghill Kang



Henle and Black Star

KOREA, OLD AND NEW

Here are two aspects of Korea's capital. Above is the modernized section of the city with the Westernized buildings of which Japan was so proud. At the right are the old imperial gardens, symbol of Korea's ancient glories.

The author of the following article was born in Korea and he knows from personal experience how much his country suffered under the Japanese. He has spent many years in America where he has worked as a staff member of the Metropolitan Museum of Art and as a professor in New York University. He is the author of "Grass Roof," "The Land of Morning Calm" and other books. At present he is acting as Chief of Publications for the American Military Government in the Far East. **Editorial Note**

THE ENTRY OF American and Russian troops into Korea marked the end of thirty-five years of enslavement. I have experienced that slavery. I have gone through the imprisonment and torture which were the basis of Japanese rule. I have also seen men, women and children scarred and crippled under the Japanese lash.

After victory over China, in 1895, with guileful purpose Japan moved against Korea. Her initial demands were that she be allowed passage for troops during the Russo-Japanese war. At that time was signed a treaty in which Japan stated that she had no designs upon the independent sovereignty of my people. Japanese troops, however, were never withdrawn. They remained to protect the swarms of unscrupulous Japanese adventurers who followed. Thereafter Japan moved in deliberately, step by step. She seized silent control of the incompetent and bewildered government at Seoul: hemmed in by spies and by Japanese generals on every hand, the old emperor was made to abdicate to one of his sons in 1907. The empress was poisoned because she was an obstacle to these plans. At last, the net complete, Japan spoke plainly. On the twenty-ninth of August, 1910, all treaties were annulled. Korea was formally declared annexed, by decree of the Japanese government.

An autobiographical account may illustrate how the news was received by the helpless Korean populace. When the news reached our home in the north, my father was so

Black Star

VILLAGE GIRLS IN WHITE

Once worn only as a symbol of mourning, white became the permanent color of clothing for everyone during the long tragic years of Japanese oppression.

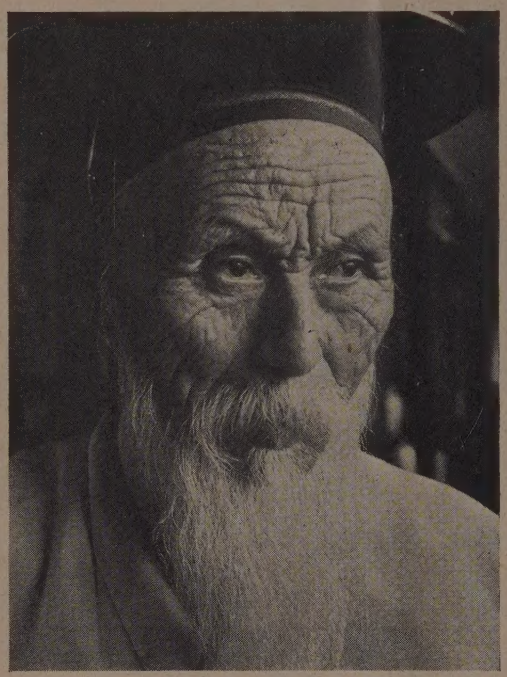
stunned that at first he could not open his mouth. My rich uncle seemed suddenly to have grown old; he lay in his inner room in a faint. My poet-uncle was for the first time wordless, and sat in his studio, blankly staring ahead.

I was a small boy at the time. My first thought was a selfish and immature one: "Now I can never be a prime minister." I burst into tears and ran out of the house to join the children standing around with scared, blank faces. The village was unnaturally quiet. Nobody, it seemed, could find words for the magnitude of the disaster. Later in the afternoon, people were weeping everywhere; it was as though every house in the village were mourning for someone who had died. Young hotheads began drinking and lamenting their fate.

When my father strode out of our house, it was with a lurching step, though he had had nothing to drink and nothing to eat since morning. "My poor children!" He held out his hands to the youngsters of the village as if we were all his eldest sons and tears streamed from his eyes. "This is death and ruin. It is the starvation for us. Who knows when a happy time will come again!"

He put up the Korean flag over our gateway and bowed down to it. Then he returned to the house and lay down, still refusing to eat. My grandmother sat up by candle-light in the same dress she had worn in the morning. Again and again she took a cup of rice-tea to my father, who lay despondently on his mat and would not accept it.

Unheeded by anyone, I crept into the anti-room of my poet-uncle's studio, hoping to find comfort in his solemn classical books. I heard him storming about and muttering to himself, so with my wet finger I made a hole in the paper door and looked through. He stood before the window shaking his fist at the sky and soliloquizing bitterly.



Evans from Three Lions

The sufferings of the thirty-five years of Japanese tyranny are reflected in the face of this venerable Korean.

"O stars and moon, how have you the heart to shine? Why not drop down in a thunderstorm and cover all things up? And mountains, with your soul shining and rustling in the green leaves, can't you understand? The end has come! No more national career for these people who have lived with you all these ages, who have slept in your bosoms, whose blood you have drunk, whose muse you have forever been? You ghosts of the hollows and you spirits of the waters, how can you bear to see death come to this people established among you for 4000 years since the first king Tan-goon appeared on the white-headed mountain by the side of the Sacred Tree?"

As I cried myself to sleep that night I heard outside the jingle-jangle of the bells of the cows which had not been put up for the night.

In the morning it was found that several of the young men who were loud in lamentation the night before had committed suicide. Their bodies lay along the banks of the stream where the women usually did their washing. Others had fled the village to see what kind of resistance movement might be organized.

Soon a Japanese policeman came at the head of a group of blue-coated Japanese, each heavily armed. Of course they knocked at our gate, and asked why we did not fly the sun-flag of Japan instead of the red and white flag of Korea betokening the male and female realm, in accordance with the Confucian Book of Changes. My father, an obstinate man, shrugged his shoulders and pretended not to understand Japanese. The small Japanese policeman then flew at my father, kicking and striking him, and threatening him with his sword. My grandmother who was looking out of the window ran out without even stopping to put her coat over her head, as was the custom, to screen her face from vulgar eyes.

"Don't touch my son!" she said. "He has had nothing to eat these two days and doesn't know what he is doing." The policeman kicked her fiercely with his heavy boot. Her sons, seeing it, gasped. In the eyes of Koreans, to touch an old woman, the mother of sons, was a crime punishable by death. Even criminals were safe behind a mother's

Like the Japanese the Koreans always sit upon the floor. In this drawing room in the royal palace, however, three elaborate upholstered chairs indicate the vulgar and pompous Westernization encouraged by Japan.

Ewing Galloway

A PUBLIC PARK IN THE CAPITAL

To the visitor during Japanese domination Korea's capital seemed sufficiently peaceful and prosperous. An efficient army and spy system kept the peace; prosperity was an almost exclusive possession of the Japanese.

or an indulgent grandmother's skirts.

My grandmother lay as if dead. My father lifted her on his back and started off toward the market place a few miles off, where there was a fairly good doctor. But her ankle was broken, and she was sick for many weeks.

Owing to a lack of modern weapons, outward resistance to Japanese dominion in Korea was impossible, and Japan had every opportunity to show a prostrate and disarmed people some glimmer of justice or common humanity in the years that followed. She showed none. Instead, with each passing year, she ground down the helpless Koreans into ever deeper humiliation. Yet she could not break the Korean spirit and she knew it.

Her program was for a new Japanese empire, based on Bushido totalitarianism, and dedicated to a ruthless policy that hoped to extend Japan's dominion over the entire world eventually. This she called the "New Order for Greater East Asia." When she tried to persuade eight hundred million Chinese and Indians in Asia, and one hundred and ten million South Sea Islanders to join her, why did she fail? Why did not Asi-

atics believe Japan's words about "co-prosperity?" They had noted her actions in Korea. There they could see what happened to a people under the domination of the Japanese.

Under Japan, Koreans had no legal rights. Judiciary power was entirely in the hands of the gendarme. No warrants were needed for arrests, prisoners were held incommunicado, after having been arrested on the slightest suspicion, and nothing could be done about it by parents or relatives or friends or lawyers. A rigid secret police system was maintained, and tortures, horrible and indecent, were used to force confessions. There were chambers of inquisition from which prisoners did not issue alive. Others came out life long cripples. I have known many of these Koreans, who must wear permanently the scars of such ordeals.

But these were merely the things that happened behind closed doors. Innumerable people were openly beaten, kicked, shot, bayonetted and flogged to death, without charge or arrest.

Forty years of this! The Philippine Islanders had but a few years. A harsh school, but it makes for world-consciousness, for a desperate hope in a world court to take up the causes of the neglected small countries of the world.

Why do the Koreans believe in democracy? Because it teaches civil harmony. Democracy alone seems to stand for belief in the Word against the Sword, and a judicial trial rather than capricious maiming or death at the hands of some insolent gendarme who strikes where he pleases.

How could a man hope to prosper in Korea, under the Japanese? Over seventy per cent of the Koreans are farmers, using primitive methods to cultivate the land. Korea to the Japanese was valuable strategically. From the beginning, it was Japanese policy to settle here as many of their own people as could be induced to come, and to drive the original inhabitants further on toward Manchuria or Russia. This plan of ousting the Korean landholders was succeeding very well.

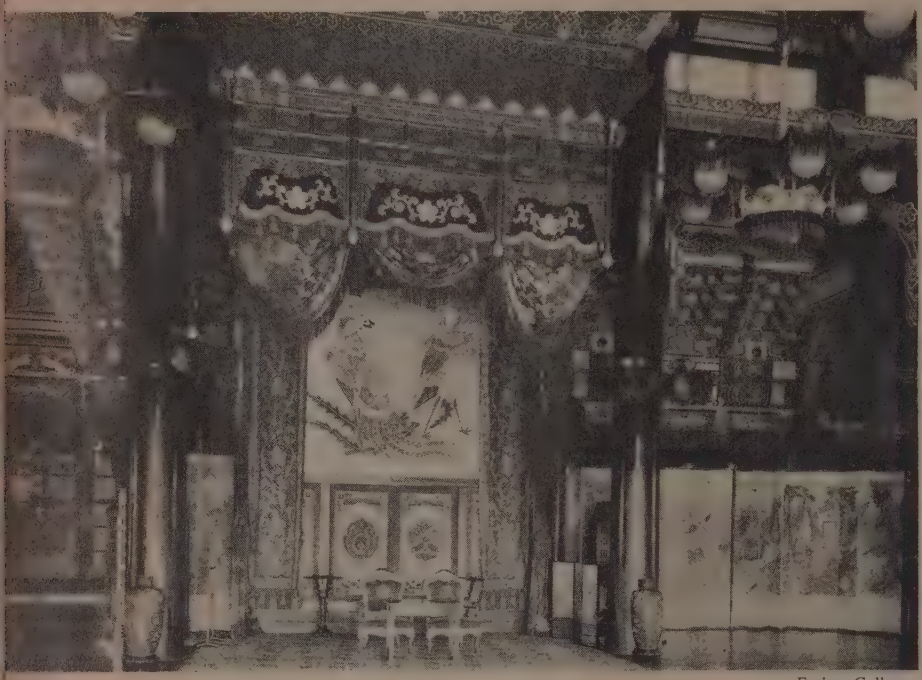
Korean farmers grew poorer and poorer as the years went by. They could not make profit. Machines, as a time-saving device, were expensive. If they tried them, they had to borrow money from the Japanese subsidizing company (the so-called Oriental Development Company) at high rates of interest. A favorable rate of interest was one of the inducements held out to Japanese colonists. When unable to pay back, the Korean farmer lost his land to the Japanese company, which was promptly taken over for re-distribution to Japanese farmers. There were other methods of gaining the same end. One of my relatives lost his land because he failed to register it soon enough under the new Japanese regime. Moreover, if a farmer owned a piece of land near a Japanese farmer, he was forced sooner or later to sell out in the interests of Japanese expansion. Certainly, a Korean need never hope to sue a Japanese in a Japanese court. In theory, yes; in practice, no.

A good many years ago, I knew a Korean who studied agricultural science in America, and went back with high hopes for improved farming. After struggling for fifteen years to realize his dreams in Korea, he gave up in hopeless discouragement. The last I heard of him, he was teaching land-economics in Nanking, China. What became of him when the Japanese arrived there, I do not know.

Nor could the Korean business man expect anything but defeat at the hands of his Japanese competitor. In post offices, custom houses, long distance telephone service, telegraphs, etc., he must wait until all Japanese interests had been satisfied first. I have a cousin who helped me in buying my ticket for my American voyage. He was in business in my home town dealing largely in china and glassware. His orders were always long overdue, and when they finally came many pieces were broken or chipped. But his next-door neighbor in the market place, who was a Japanese in the same type of business, always received his goods on time and even the most fragile pieces were intact. My cousin was a trained man, skilled in handling merchandise and eager to find new outlets for Korean products, but he had to give up his business. He next tried to manufacture rubber shoes. In spite of the utmost industry and alertness, he failed. But during years of hardship, he did manage to train his younger brother in medicine. Now he is filling prescriptions in his younger brother's office.

Medicine was the field with the least drawbacks for Koreans and the profession attracted many of the young men. There was always a need for doctors, and a Korean doctor could work without opposition from the Japanese who were anxious to avoid sickness and plagues. There was one Japanese medical college in Korea which admitted some Koreans.

Everybody knows Korea needs science and



Ewing Galloway

IN THE PALACE OF KOREA'S EMPERORS

Japan detroyed Korea's royal family ruthlessly: first by forcing the Emperor to abdicate and appointing a puppet emperor; then, in 1910, by forcing their puppet to surrender his crown and his country.

THE OLD CITY GATE IN SEOUL

This double roofed gate tower is one of eight similar structures that formed part of the crenelated wall eleven miles in circuit and thirty feet high which formrly surrounded the Korean capital.

industrial development. What more promising than the field of engineering? But here again there were difficulties. No Korean engineer could get any important contract under the Japanese. If he got a job at all, his salary would be one tenth of that given a Japanese with the same training.

I knew one successful lawyer in Korea, who helped me materially when I was a boy, and who promised to support me through my internship providing I studied medicine. This lawyer, a Mr. Hur Hun, kept on practicing after the annexation, and even tried to defend the famous thirty-three who signed their names to the Korean Declaration of Independence in 1919. But he could not do much for them. No Korean lawyer could.

Henle

Foreigners were almost invariably impressed by the appearance of Seoul's main thoroughfares during the Japanese occupation. They represented that nation's imperialistic vigor, but concealed the conditions under which the Koreans actually lived.

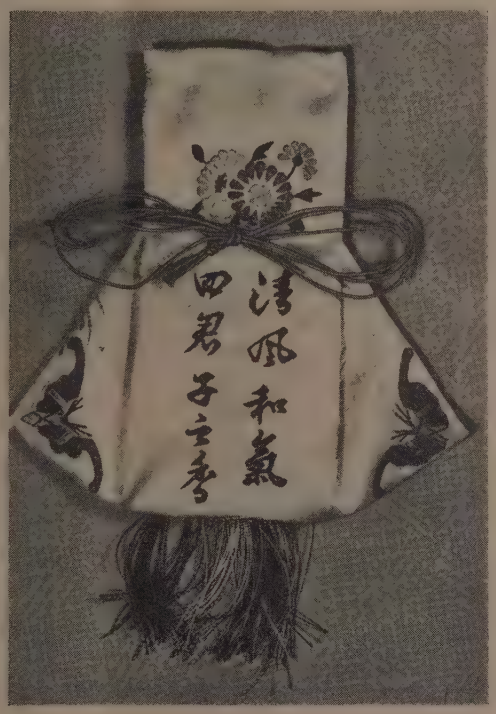
The most a Korean lawyer could hope for was to be a subordinate petty official under the Japanese government. Otherwise lawyers had to carry on petty legal activities for their people such as filling out application blanks and drawing up business documents. Since many Koreans could not read Japanese lawyers were essential in numerous transactions.

During the thirty-five years of Japan's occupation of Korea, the policy of Koreans was endurance, underground activity, solidarity in detesting the aggressor nation, and resistance when possible—but never resignation. At the end of the first World War, the peaceful revolution of 1919 was organized secretly. It was inspired by President Wilson's words at the Versailles Conference. "We are here to see that every people in the world shall choose its own masters and guide its destinies not as we wish, but as it wishes." The Korean people planned to voice their protest against the Japanese regime so that all the world might hear. It was to be entirely peaceful, and dedicated to a course of non-violence. In short it could have no political upshot and was expected to have none beyond that of placing the Korean people on the record before a world court as claiming their right to their own independence.

Black Star

KOREAN EMBROIDERY

The exquisitely embroidered purses above and below are examples of the Korean craftsmanship which the Japanese wisely encouraged. Like the Chinese the Koreans were gifted artists whom the Japanese willingly imitated.



March the first, 1919, was the date decided on. I was a student in Seoul at the time. The city was packed, I remember, like Rome during pilgrimage year. Hotels were crowded beyond capacity. Every guild from different parts of the country was represented, each dressed in its own costumes. Each and every family in Korea had been notified by the leaders in the underground group of the plan and the purpose of the peaceful Korean Declaration of Independence to be read at two o'clock in the public park. People stood in excited groups everywhere. Japanese police were nervous. They did not know what was coming.

It was hard to get into the park because it was so crowded. As we boys were young, slender and active, we managed to weave our way in. There was a pagoda in the park and not far from the pagoda was an improvised speaker's platform which had been carried into the park the night before. With the spring of an athlete, a large and robust man leaped upon this scaffold in one bound. He began to read in Korean, with eloquent, clear enunciation, the inspired document by the foremost writers of Korea, a prose poem throughout. The people maintained a tense silence, with fixed faces and clasped hands.

"With this we declare our Korea an independent nation, and Koreans a free people. With this we announce her independence to the ten thousand nationalities of the world, and so reveal the Great Truth of the equality of man. With this we endow our sons and our sons' sons for innumerable generations, with the just right of national self-existence always.

"A new Heaven and a new Earth stretch out before us. The age of force and arms is gone, the age of right and justice has come.

(Continued on page 30)

THE AMERICAN TROOPS ARRIVE

The arrival of American troops in the Korean capital was greeted with enthusiastic demonstration. Today Koreans are wondering why both American and Russian troops still remain.

Signal Corps

THUNDERING HERDS OF PREHISTORIC AMERICA

by Gil Stucker

Chicago Natural History Museum

Hundreds of miles from any existing sea, razor-edged, fossil shark teeth are found in the rocks of Mississippi, imperishable records of a time when the Gulf of Mexico covered much of the southern United States. Below are the jaws of a giant fossil shark compared with those of the contemporary shark in the center.

IT WAS SPRING in Mississippi. The first magnolias had broken bud and filled the air with sweetness. High in the sandy pine-barrens the promise of summer was in the wind; in the bottom-lands the heat hung hot and heavy in the river-haze.

The pipes of Pan had sounded the passing of winter and every creature with a voice took up the chorus. Fields were vibrant with the furious din of insect fiddlers; swamps throbbed to the tin-pan-alley of the frogs; woodlands rang with the melody of birds, and even man whistled while he worked.

Never were conditions more conducive to the contemplation of nature over a cool julep beneath some drooping willow.

But this was not for me. Being of an inquisitive turn of mind and a fossil-hunter, I was inclined more to investigation than meditation. I had no time for the living and its beauties. My business was with the dead—and the mysteries of the forty-million-year-old past.

Some weeks previously, naturalists had been roused from their research by a startling report—"Titanothere in Mississippi!" Professor J. M. Sullivan of Millsaps College had found the petrified skull of this extinct mammal embedded in a creek bank on the edge of the sleepy village of Quitman, twenty-five miles south of Meridian.

Now, such discoveries are not made every day. Indeed, this was the first of its kind. It had never happened before and many scientific sceptics doubted if it had happened at all. It was like having a whale pop up in the Great Lakes or an elephant suddenly appear in Times Square.

Not that Titanotheres are particularly unusual in themselves. These lumbering brutes, half tapir-like half rhino-like, were fairly numerous some two-score million years ago and many of their mounted skeletons are on display in museums today. They managed to get around in their time, roaming in great herds over much of interior America. From the abundant remains scattered over Utah, Wyoming, Nebraska and South Dakota, it is supposed that these states formed their principal stamping-grounds. Few specimens had ever been found outside this general area in the United States; consequently, news of the Quitman mystery produced something of a sensation.

Mississippi was hardly the place for a self-respecting, land-lubbing Titanothere to be caught alive—or dead. In the age when these creatures lived, the Gulf of Mexico extended far north of its present limits—overlapping much of the Magnolia State, Louisiana, and adjacent territory. It was logical to find evidence of sea-life in the deposits left by this vast embayment . . . but who ever heard of a sea-going Titanothere!

The beast was a thousand miles off the beam . . . "or its discoverer was," chuckled the sages. Whichever the case, a little detective work was in order.

Anxious to be off before my fellow fossil-hounds took up the scent, I started my one-

Chicago Natural History Museum

TITANOTHERES GRAZING

Ages before the buffalo made its appearance on the earth, the mighty Titanothere was lord of the prairie. These great beasts ranged far and wide over the continent.

man expedition rolling south. Orders from the boss were specific. "Get the critter and bring him back."

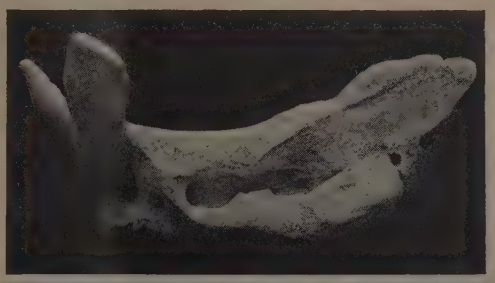
I might just as well have "stayed to home." Arriving at the seat of the mystery, I found it empty. All that remained of said skull was a neat excavation where it once had rested in the walls of a gully.

Professor Sullivan had already sent the specimen to Washington where it was duly christened, in the best scientific tradition, *Notiotitanops mississippiensis* (the southern titan from Mississippi)—a Titanothere new to science and the first of its kind to be found east of the Great Plains. The skull was apparently that of a maverick that had strayed from the herd and, in wandering south into the coastal marshes of the ancient Gulf, had been drowned and washed out to sea.

Where was the rest of the beast? Where there had been skull there might be skeleton, or even parts of other individuals as yet undetected below the surface. With pick and shovel I ransacked the locality. Result: a batch of enormous saddle-shaped fossil oysters, but not a scrap of bone. Evidently, Titanotheres and I were not destined for each other.

However, the student of prehistory is seldom at a loss for things to hunt. Wherever there is rock—there is hope.

Rocks are the mirrors of past ages. In them we find shattered reflections of things that once were life. In places the image of the past looms large and fairly distinct; then



THE MISSISSIPPI MYSTERY

The discovery of the skull of a Titanothere in Mississippi was so unusual it was dubbed the Mississippi Mystery.

ZEUGLODONS

Forty million years ago yoke-toothed Zeuglodons, eighty feet long, once swam the seas over by-gone Dixie. The tail bone of one specimen measures eighteen inches in length and weighs sixty pounds.

Chicago Natural History Museum

Chicago Natural History Museum

BIG GAME FOR THE FOSSIL HUNTER

Titans of ancient America, the mighty Titanotheres, roamed in great herds for 11,000,000 years over what is now the United States; then they vanished from the earth.

again it may be fragmentary and barely discernible. Sometimes there is no form at all, but even then the rocks, by their very nature and disposition, have written the story of long ago.

Beneath thickly-wooded slopes, the Chickasawhay River slips—slow and easy—between the hills. In more riotous mood it had stripped its banks of soil and vegetation and partially exposed the bare bedrock.

Folks hereabouts had "heard tell" of big bones in these rocks. The problem was to find them.

From the very beginning, my quest for the big bones was an amphibious undertaking. The river banks were covered with ooze more congenial to the natures of eels and mudpuppies than the likes of men.

Progression was a matter of reverting to our ancestral position on all fours and squirming along *à la* salamander. This method had its disadvantages, being extremely messy and, what with the hands thus busily occupied, one made easy pickings for the swarms of gnats, flies, wasps and mosquitos. Keeping the pests at bay with back-hand swats of my geologic pick was a precarious business on the slick surface. Decayed rock ledges continually gave way and plunged one into the green scum below. Water moccasins lay coiled at all too frequent intervals—heads drawn back ready to strike—cottony mouths agape. Man was meant to walk erect!

Where tangled brush pressed close to the shore it was necessary to hack out a passage. Further along, the slippery marls were so steep toe-holds had to be dug. Here and there, raised knees of bald cypress afforded purchase for hands and feet. Sad willows draped the gloom of the river's edge; high up the slopes tupelo, oak, and sweet gum tossed in the sun. Pale mushrooms huddled in moist hollows. Great trees lay across the path like fallen giants—trunks overgrown with velvet moss. Down in a glen the dead still stood in a mortuary forest, stretching lifeless shafts skyward.

Slowly the world of the present passed into that of the past. Traces of the prehistoric sea that once covered this land appeared in the rocks—thin round disks of sea-urchins showed white against the darker clay; thick layers of scallop shells and bits of petrified crabs; pockets of fish vertebrae and tiny needle-sharp shark teeth.

Then, lo and behold!—the first sign of bone. The broken end of a rib jutted from the clays above the shell masses. A moment's furious digging disclosed the elongate tail bone of a fossil whale. Eureka!—a Zeuglodon. It wasn't a Titanothere, but the next best thing. Below the discovery, half-buried

Buried for ages, bones turned to stone, a fossil skeleton requires weeks of painstaking labor before it can be exhumed. After the surrounding rock has been carefully removed, the fragile bones are hardened with shellac, wrapped in plaster-of-paris casts, boxed, and shipped to the museum.

in river-wash, were scattered yoke-shaped molar teeth from which the animal takes its name . . . *Zeuglon*—"yoke," *odon*—"tooth."

Zeuglodons were quite common in the shallow seas of ancient Dixie, so we are led to believe from their numerous remains found in rocks of the South from Florida to Arkansas. They were huge sinuous beasts more closely resembling the mythical sea-serpent than the living whale. Some forms grew to eighty feet in length; yet, for all their bulk, these leviathans were no match for the monster sharks that stalked them and may have caused their extinction.

Not content with just one "find" and hoping I had stumbled on a shoal of the creatures, I continued the search down-stream. At two other places, paddle bones and teeth showed in the bank.

Beyond these the bone-bearing beds disappeared under more recent rock layers. Trail's end came at the foot of a crumbling red bluff abounding in small, delicately-spiraled fossil shells called gastropods. From here I retraced my steps to begin the task of resurrecting the dead.

First with pick, mallet and chisel, then with brush and awl, the clay was worked gently away from the brittle bones. By the time they were hardened with shellac and ready to be encased in protective casts of plaster-of-paris, full summer had come to the river-bottoms.

Life in the lowlands slumbered. The river flowed like black molasses through the shadows, clinging to the shores, toying lazily with bits of debris and floating logs. The only sounds were those of a world asleep—half-conscious murmurs from the deep somber forest.

Sometimes colored folk wandered down the banks looking for wild dew-berries in the thickets, or to have a try for that big catfish that lurked in the green depths, or maybe just to relax in the shade. They regarded me with suspicion at first, and there was gossip about town concerning the crazy man from the North. Many thought my excavations were just a "blind" and that I was really a revenue agent spying on the moonshine stills in the hills; others suspected it was oil I was after, or De Soto's buried treasure that rumor had cached away somewhere in the vicinity. One curious soul ventured to question me and when he learned I was hunting whale—he was certain I was stark, staring mad.

Then one Sunday, in the rickety "churchhouse" in the pines, Preacher Jones informed the brethren that my "prohysterical monsterocities were indubitable evidence of the Biblical Flood." "Does not the Good Book say, 'Go to the rocks and they shall teach thee'?" From then on, in their eyes, I was doing the "Lawd's" work and became an object of awe. No one, however, offered to ensure his salvation by assisting in my "divine" labors. I guess they preferred to gain "Heb'n" the easy way.

Among my other visitors were spunky little lizards who came scurrying down the slope for a look-see, bobbing madly up and down in their ridiculous way, as though their legs were made of rubber. Dragon-flies buzzed around occasionally.

One old crow became quite bold and strutted about the "dig" as if he owned the place. He would have—had I let him. He was into everything, especially my lunch when I wasn't

(Continued on page 34)

MASTER BUILDERS OF THE AIR

by Hugo H. Schroder

With photographs by the author

MOST OF OUR native birds build their nests for only one season. They may return to the same region the following year, but a new nest is usually constructed each year. Few birds nests can survive the storms of winter, most of them either disintegrate or disappear. Bald eagles build for the future, as well as the present. Usually they choose a tall living tree in a region near water, although they will build in a dead tree if there are no suitable live ones available.

Today bald eagles are not often seen in many sections of this country, but in Florida they are present in considerable numbers. During the years I lived in eastern Iowa, only a short distance from the Mississippi River, I saw bald eagles so seldom that they were to be classed among the rarer birds of that region. When I first visited Florida I lived on the banks of the Indian River for some months; there I soon discovered that bald eagles were numerous. I saw more eagles in Florida in a single month than I had observed elsewhere in all my life.

At the beginning of the nesting season, the old nest is made ready to receive the new set of eggs. Additional coarse sticks and other nest materials are added to the old structure. In Florida egg laying usually takes place from November to February. There are usually two eggs in the set, although sets of three are sometimes found.

Even a first year bald eagle's nest is not a small structure, for these large birds need a substantially built nursery for their babes which remain in the nest for more than two months. As the period of incubation is said to be about thirty-five days, this means that the nest is in constant use for a period of about fifteen weeks. After a nest has been added to regularly during a ten year period, it becomes rather bulky and heavy. Some of the older nests I have seen are of gigantic proportions.

A nest in Ohio was known to have been used for a period of thirty-five years; perhaps it might have served for a much longer time but for the destruction of the nest tree during a storm. When measured a few years previous to its demolition, this nest was found to be twelve feet high and nearly nine feet in diameter.

Practically all of the nests I have seen in Florida were built in pine trees, although cypress trees and mangroves are also used. When a nest site is selected there is usually considerable space between the limb on which it is placed and those overhead, thus allowing the big birds freedom of movement to and from the nest. As the young eagles grow larger, they need sufficient space to exercise their wings for some time before leaving the

RETURNING TO THE NEST

Gliding downward with outstretched claws a handsome bald eagle drops to its nest perched precariously in the fork of a dead tree.

eerie. At times the eagles miscalculate when placing a nest by not allowing room overhead for expansion during the years. One nest photographed on Merritts Island some years ago was a double nest. The original nest had been built up until it came too near the limb above, thus interfering with the bird's movements at the homesite. Instead of abandoning the nest and moving to another tree, this pair decided to move up higher in the same tree. A new nest was started on the limb just above and this had grown to even larger proportions than the original one.

Another double nest was discovered on the Gulf Coast about ten years ago. A third double nest was later found on Merritts Island.

Many of the bald eagle nests I have seen were investigated by my companion, J. C. Howell, Jr., who has made a study of the nesting of eagles in Florida. While he climbed to the nests I watched the actions of the birds. The first time I saw him scaling a tall pine to an eagle nest. I anticipated that the big birds might show signs of aggressive action against the invader. However, all that happened was that the birds uttered their calls of protest while flying about at a distance from the nest tree. At no time did they come anywhere near the climber. Practically the same thing happened at every other nest which was investigated. Only vocal protests were made as the birds flew

CLIMBING TO AN EAGLE'S NEST

The size of this eagle's nest may be judged by comparing it with the man who is climbing the tree. The nest is unusual not only because of its size but because it is on a limb and away from the main trunk.

ON THE LOOKOUT

Trees near the rivers, lakes and marshes of Florida make ideal nesting places for bald eagles. In such regions they can easily secure a plentiful supply of fish.

IN THE FLORIDA PINE LAND

In the cut over pine land of Florida eagles' nests are clearly visible in the few remaining tall trees.

around and around harmlessly at a distance.

The eagles could easily cause serious injury to a man, if they were so inclined. They could even knock him out of the tree, for they are large and powerful birds. But the usual procedure followed by the eagles when their nest is being investigated is to remain at a safe distance, while occasionally uttering their notes of protest. Seldom do they come anywhere near the intruder at their eerie.

Since fish are the principal food of bald eagles, it is interesting to note that both live and dead fish are taken. Eagles plunge after fish swimming in the water; they also pick up dead ones from the shoreline, thus acting as scavengers. These eagles are frequently guilty of piracy, for they delight in robbing the osprey of its fish.

A friend of mine was working in his pineapple field when he heard the alarm call of an osprey; as he straightened up from his work he was surprised to find a good sized fish dropping at his feet. The eagle giving chase to the osprey had evidently hesitated to follow the fish when it was dropped, because of the man on the ground below. However, it seldom happens that the osprey's fish manages to escape being seized by the large winged bald eagle, when the rightful owner decides to drop it. I do not recall that I have ever seen an osprey which was able to elude the relentless pursuit of the eagle.

While fish is a favorite food of the eagles, it is by no means their sole food. Wild ducks and coots wintering in Florida are frequently victims of the eagles. I watched an eagle hovering over a flock of scaups on the Indian River, then saw it dive into the flock and seize one of them. Various other birds are victims of the eagles as well as rabbits and other small animals.

Some years ago I spent considerable time in a blind near an eagle's nest in a dead tree on Merritts Island, where I could watch the actions of the adults and their young, and try to secure photographs of the eagles as they landed at the nest. There was a dense tangle of saw palmettoes, vines and shrubbery between the nest tree and the highway, several hundred yards distant. If the eagles were at the nest tree, or in a nearby dead tree used as a lookout station, when I approached they would immediately fly toward me, uttering their notes of protest as they circled with strong wing strokes. But they always kept far enough away from me so that it was impossible to secure any worthwhile flight photographs.

There were two young eaglets in this nest. During one of the earlier visits I watched an adult bring in food which was torn up and passed to each of the babes. Later, the food was deposited in the nursery for the youngsters to eat whenever they became hungry.

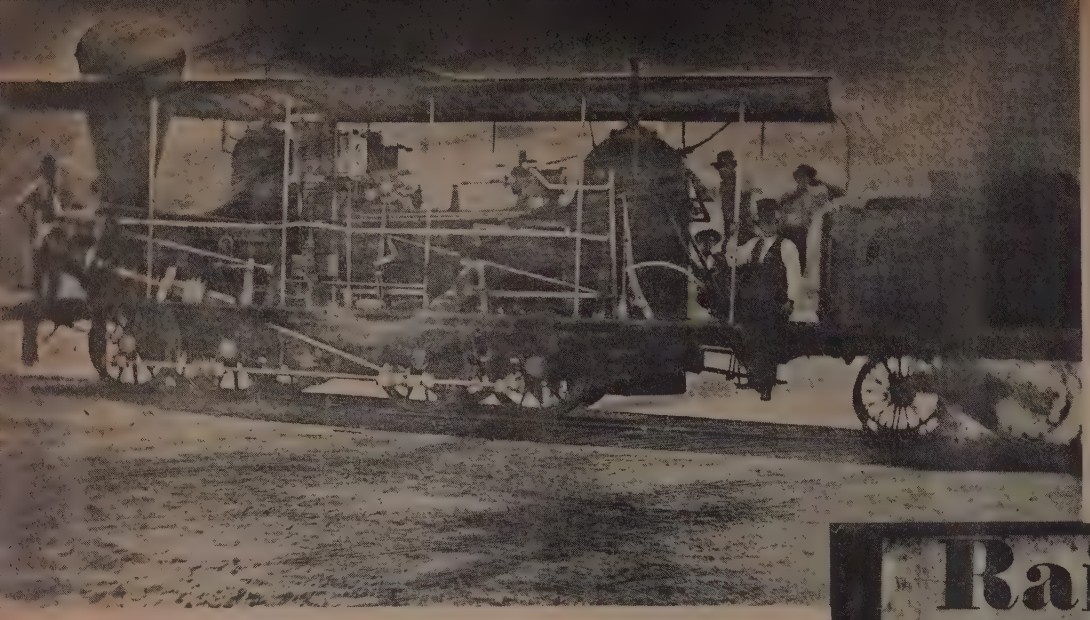
On one occasion when I left the blind, both

(Continued on page 32)

THE AMERICAN BALD EAGLE

Gendreau

The bald eagle is as remarkable for its impressive appearance as for the power and stateliness of its flight. Not until it is three years old does the bird attain the white head and tail feathers by which it is so easily identified. Younger birds are streaked with brown and grey.



THE FIRST HILL CLIMBER

To climb a steep hill a little over a mile long on Indiana's first railroad this odd looking engine was constructed with a pinion working in a rack in the center of the track. Below is an early excursion notice in the days when railroad travel was adventure.

Rail Road.
Pleasure Trip!
The public are informed that the PASSENGER CARS will leave the lower end of West street,
To-morrow morning,
AT NINE O'CLOCK.
All who wish to take a passage, will be taken to the end of the road at Griffith's Tavern, and back again to Madison for FIFTY CENTS.—Those desirous of a ride on the rail road would do well to avail themselves of this opportunity, as it may be the last one that may occur for the same price. Tickets may be had at Mr John Woodburn's new building on the corner of West street, from and after seven o'clock, A. M.
JOHN LODGE, Sup. Trans.
Madison Depot, Friday, Nov, 5th, 1841.

INDIANA'S OLDEST RAILROAD

by Robert L. Grimes

IF YOU WANT to become an expert, choose a railroad. Preferably an old one. Railroads don't just come and go. Once established as an artery of a section of the country, a railroad stays put. The inception of that railroad, its impact upon a community, and the relationship of a road and the people it serves in the after years—all make interesting terrain for the would-be expert to explore.

And without much expense, too. Generally you can tip a chair against a wall, and let the place come to you. No poring over tourist books and time tables; few compulsory connections. Loaf around. Listen to people: they like to talk. Especially old people. They'll talk about themselves first; then their community. Which is as it should be.

A few days sitting around during the past year, a few strolls to nearby points of interest, and I became an authority—all right, self-appointed!—on Indiana's oldest railroad. Called first the J. M. & I. (Jeffersonville, Madison, and Indianapolis), it was later known as the P. C. C. & St. L. Railroad, and is now a part of the Pennsylvania system. It wasn't difficult, for the people of the towns strung along the main line and the branch (Indianapolis to Columbus, Indiana; Columbus to Madison, on the Ohio River) are a generous and loyal lot, anxious to go through their old photo albums, and to re-rake the ash-dimmed embers of memory.

A hundred and ten years ago Madison was a booming river town. It was a city of inns for travelers on their way west. For the people of more settled communities up the Ohio River, clear to Pittsburgh, it was a pork-packing center. Madison pork was famous for its firm texture and nutty flavor; and once the town had a narrow escape from being re-named "Porkopolis."

The hog farmers around Madison in those days never worried about a corn crop to fatten out their porkers. Instead, they slopped their shoats all summer on dishwater, and in October turned them out into the great forests to eat "mast."

This mast was the acorn crop, principally the acorns of first-growth white oaks, whose fruit was large, succulent and fattening. In the hilly country, beechnuts resulted in the best bacon a porkeater ever speared out of the frying pan.

For four months or longer the farmer forgot about his hogs. Then one winter day he would call his children, whistle to his dogs, and set out into the woods. If he'd turned thirty shoats loose, he drove thirty fat pigs out of the forest. It didn't matter whether he got his original thirty back. There were no fancy breeds; one hog was as good as another, since all fed upon the same mast.

Madison then was as big as Indianapolis; and New Albany, further down river, was bigger than both. Indiana statesmen figured that some of the westward-ho travelers passing through Madison might well be diverted, to settle the wild spaces north of the river. More farmers meant more pigs; more pigs meant more jobs in the packing houses—as well as bigger and fatter catfish in the river next spring.

The legislature therefore authorized the construction of a Madison-Indianapolis railroad. Work was begun in 1836, at the Madison end, and terminated at Indianapolis in 1847, a distance of eighty-six miles. The road was built piecemeal, and to a variety of financial schemes and sponsorships. The greatest problem was the cutting of the inclined plane, called "The Hill," running from Madison north some seven thousand feet to North Madison. This took nearly half as long to build as the remainder of the road; and no one knew whether an engine might be constructed to pull the grade, once the cut was completed.

Visitors find Madison noted for its wooded escarpments, which palisade it upon all but the river side. These huge shoulders, at one time the river bank, are beautiful to the eye in all four seasons. To the railroad builders of a hundred and ten years ago, the Madison Hill was the field for a great engineering feat.

The cut can be examined today by the careful motorist while descending Highway 7, at various parking elbows. It can more profitably be viewed by the pedestrian who

THE HILL

The builders of the Madison-Indianapolis railroad considered the construction of this section of the track their greatest achievement. The grade approximates six percent and the cut in the solid limestone is one hundred feet deep in places.

walks a few hundred feet down from the gargoyle-trimmed station at North Madison; or by standing on the railroad-bridging culvert on Highway 56, and looking upward. The energetic hiker who wishes to examine the entire cut at first hand will find two major incisions—one sixty-five feet deep and the other one hundred feet in depth, cut through solid limestone. The entire plane is 7,012 feet long. The elevation is 413 feet per mile, plenty of grade on any man's railroad.

Admiration for the old timers who engineered this cut is somewhat tempered by the knowledge that easier routes either to the east or west were available. But one of the state railroad commissioners owned property between North Madison and Madison proper. He figured that the proposed direct route would enhance the value of his property, besides giving work to his son-in-law as resident engineer.

Several hundred thousand dollars were later spent on an alternate route, which was given up uncompleted.

When the present cut was completed, cars were let down the grade by gravity, and pulled up by horses. In 1848 Andrew Cathcart built an odd-looking engine with a pinion working in a rack in the center of the track. This pinion received power from two vertical cylinders. It is also said that later a type of cog engine was used. Records show however that the Cathcart engine was used until 1868, when the *Reuben Wells* engine, built by a mechanic of the same name in the shops in Jeffersonville, was put into service. No one but the maker believed that the *Reuben Wells* would ever climb the grade. But Wells had figured the grade and the center of gravity on his engine accurately, and had put his faith in drive wheels that were extra large for those times. These wheels not only did not slip back down the track; when helped with a dash of sand, they even pulled cars upward!

Hill engine Number 634 was built in 1896. The coal compartment was placed on the engine proper and was carried in a saddle-like container straddling the boiler.

Following a near accident in 1880, orders were issued that an engine must be connected with all cars going up and down the cut. The *M. G. Bright* had blown up; in 1896 a new type of hill engine, *Number 634* was put into service, while the *Reuben Wells* was held in reserve.

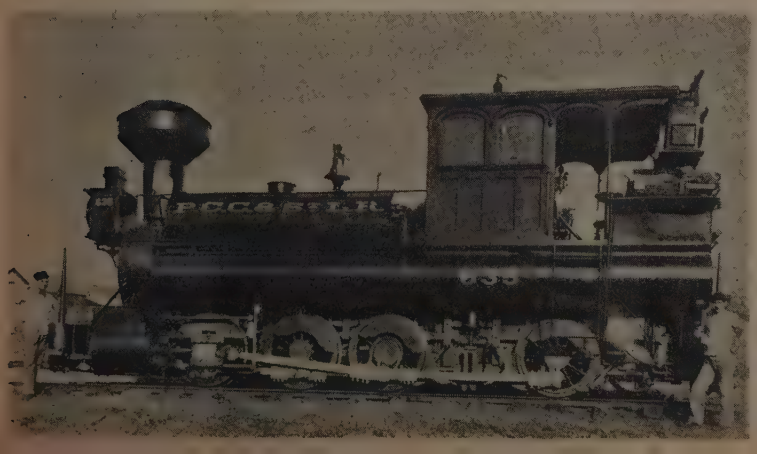
To the mechanic this special engine was quite a curiosity, and many a railroad man took the trip to Madison merely for the purpose of inspecting and perhaps riding the behemoth. It had no coal tender, the coal compartment being located on the locomotive proper. Water was carried in a saddle-like tank straddling the boiler. This extra weight gave added adhesion to the rails. Hill engines were always hooked to the downgrade end of the train; cars going up were pushed; going down, they were held back.

The writer remembers distinctly a ride in a coach being pushed up the hill by the enormous contraption. The motion was a series of soft, comfortable jerks, somewhat like that felt in a wheel chair pushed by a careful nurse. Once in a while there was a pause, apparently to allow the boiler to gather steam; upon this pause passengers became anxious, peered out windows, questioned the conductor, and even prepared to jump should the train begin to slide backwards.

To qualify for running the Hill engine, engineers had to pass a special examination. Too little water in the boiler ruined the crown

(Continued on page 33)

The *Reuben Wells* was built at Jeffersonville in 1858. Thirty feet in length it was the largest engine in the world at the time.



A number of years ago the Pennsylvania Railroad took the old *Reuben Wells,* refurbished it and sent it across the United States.

On the eastern shore of the Caspian Sea opposite Baku there are the oil fields at Krasnovodsk and Emba. North of here and west of the Urals is a new, giant oil region known as "the second Baku."

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In the eighties the Baku oil fields were importing American drilling and refining equipment for the flourishing new industry founded by the Nobel brothers.

THE BLACK GOLD OF RUSSIA

by Albert Parry

Photographs from Sovfoto

OIL, OIL, MORE OIL! So cry out the Soviet Russians as they blueprint their postwar reconstruction. By 1950, that is, by the end of the new Five-Year Plan, the USSR's annual production is to reach sixty million tons. So said Premier Stalin last February.

The Russians must indeed hustle to reach this goal, because in 1940 the Soviet Union produced only thirty-one million tons of "black gold." Compare this with America's two hundred and twenty-seven million tons of oil produced in 1944, and we can see that "to catch up with and outstrip America," as the Russian slogan has it, is a herculean and spectacular if not a hopeless task.

But the story of Russia's oil has been spectacular. At all times it has been colorful and violent, no less so than the tale of our own Southwestern oil, though in a different vein.

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ALFRED NOBEL 1833-1896

The famous Swedish chemist and engineer who invented dynamite also developed the Baku oil fields from which he derived a huge fortune.

Its main chapter is laid in Baku—at the foot of the giant Caucasian ridge, in the Azerbaijanian lowlands, with their humid subtropical climate of mild winters, of autumns warmer than springs, of summers hot and rains scant, of north winds sharp and dust-laden. When the Russians speak of oil, they speak mostly of Baku, that bustling capital of the Soviet Azerbaijan, the largest port on the Caspian Sea, the site of many battles, the greatest source of Russian's petroleum.

Baku remains foremost both in legend and statistics, despite all the new discoveries and development of oil elsewhere in Russia. On

Baku's low-lying and protruding Apsheron Peninsula, ancient fire-worshippers dwelt, praying to the flames that used to leap high out of the holes in this oil-saturated ground. Early in the nineteenth century, tsarist Russia won this region from Persia. The first derrick on Baku's peninsula was built in 1863, and production started in earnest in the 1870's

The pioneers of Baku oil were the Nobels, the Swedish family of industrialists, of Stockholm and St. Petersburg. The Russian branch of this remarkable clan was begun by Immanuel Nobel, a professor of the physical sciences who about one hundred years ago came to Russia to offer the tsar's government his two inventions: a land mine, and a mine that would explode underwater. The tsar's experts, having tried out the mines, liked them sufficiently to induce Nobel to move to St. Petersburg and start all sorts of mechanical works. A Russian general became the professor's partner. Together they built mines, sundry machinery, steam engines, and finally steamboats. Lacking commercial genius, they went bankrupt in 1861. The professor returned to Sweden, penniless and heart-broken.

But Ludwig Nobel, his son and assistant, stayed in Russia. Having in time paid up his father's debts, he opened new mechanical shops and soon prospered. His elder brother Robert worked in Finland; his younger brothers, Alfred and Emil, joined their father in Sweden to continue his experiments in seeking "safe" explosives. During this quest an explosion occurred in which Emil was killed. Alfred, under his father's supervision, kept on with the dangerous work and finally evolved dynamite. The old professor died a poor man before the new invention brought his surviving sons a fortune and led to the establishment of the famous Nobel Prizes.

These were the young Nobels who came to Baku to seek and find more adventures and rubles. As their oil business boomed, the Nobels built their own shipping for the new industry. In 1878, from Sweden to the Volga and to the Caspian they brought the *Zoroaster,* an early oil tanker—the world's very first tanker, if we are to believe the claim of one of the Nobels' oldest employees, Karl Hagelin (in his reminiscences published in 1945 in New York, in Russian). From America much drilling and refining equipment was imported in the 1880s. The captains of their oil fleet, and the engineers, mechanics and foremen of their Baku fields and plants were mainly Swedes.

Many of these men, speaking Swedish only, had a difficult time ordering around their Russian and other native assistants. A young Armenien was hired to live with a group of Swedes in Baku so as to teach them Russian. By the end of several months it appeared that the Armenian learned to speak Swedish while the Swedes still didn't know Russian. So well did he master his employers' language that later he translated Ibsen's plays into Armenian, to be staged by his brother for the culture-yearning audiences of the Caucasus!

In 1901 Baku produced one-half of the world's oil, and the Nobels were at the head of the effort. But other oilmen rose to power, too: Russians, Armenians and Azerbaijanians. Some learned from the Swedish pioneers. Others worked their way up independently, learning from nobody except themselves and their own errors.

Most picturesque was Hadji Zeinal-Abdin Taghiev, an Azerbaijanian, or a Tatar, as the Russians called such native folk of north Iranian origin and Moslem faith. He began working at the age of ten as a stonemason apprentice and grew up to be a multimillionaire owner of factories, docks, a newspaper, and a theater, all thanks to the oil he struck as a young man in a part of Baku where no one had thought oil existed. Through all that he remained illiterate, signing his name with some difficulty, but able neither to read nor write. His numerous philanthropies included generous stipends to young Moslems who wanted to study. "I know," he said, "how difficult it is to live without education."

Years later when the Soviets came and nationalized the oil industry of the Caucasus, the Nobels and other foreigners (as well as many Russians) fled abroad, but Taghiev remained. He died at the age of ninety-three in poverty and hiding on the north shore of Apsheron, a charge of some fellow-Moslems who, taking pity on him, concealed him from the searching parties of the Red secret police.

Despite its wealth, life in old Baku was not easy. The oil town, built on the outskirts of the ancient town beginning with 1874, was colloquially branded *Cherny Gorod,* or "Black Town," and it was in truth dirty, greasy, and pestilential. There were neither sidewalks nor pavements. There was no sewage, and all the refuse of the oil plants was sent flowing into the streets. This included some by-products of oil that bring a pretty dollar now but were considered of no earthly use in those naive times. Natives picked their way afoot or guided their horses with utmost caution, as acids in the refuse often burned the feet of both beasts and men. The Nobels were, however, persistent in keeping their premises dry and clean. In time, other oilmen followed this Scandinavian

THE OLD AND THE NEW BAKU

Russian large scale industrialization has completely transformed Baku. At the right is a view of the Nobel refinery in the eighties with the ships of the oil fleet lying at anchor in the distance. Below is one of the principal thoroughfares in the modernized oil capital toward which the Nazi armies drove so desperately in the summer of 1942.

cleanliness as conscientiously as they could.

Much of Baku stayed what had been before the oil era—the Oriental settlement, with its ninth-century fortress of Arab style, its colorful "Maiden's Tower," its mosques and bazaars, and its welter of narrow streets and crooked alleys. Cholera, oil fires, labor unrest, racial strife—all tried to give their kiss of death to Baku, but Baku struggled and thrived in spite of it all.

Strikes of oil workers began early in the new century, and the summer and fall of 1904 found the young Joseph Stalin agitating in the turmoil. Five years later, as a revolutionary of increasing experience, he spent six months in the notorious Bailov prison of Baku. From here he was shipped into northern exile, but fled to return to Baku in secret —only to be arrested in the oil capital again in March, 1910. There is a story (quite reliable) that Stalin, the Bolshevik, and Andrei Vyshinsky, the Menshevik, first met and became friends as fellow-inmates in that prison among oil-derricks.

In 1905 the fratricide of Baku's Armenians and Azerbaijanians was wholesale and horrible, and the tsarist government was popularly accused of fostering the bloodshed, out of its well-known policy of divide-and-rule. In 1918-20 there was more bitterness and fighting, as first the Turks then the British endeavored to bolster up the native "Mussavatists," or Azerbaijanian nationalists who did not want this rich area to be a part of Soviet Russia.

The Turks were defeated by the British, who came late in 1918 but did not stay long.

The oil derricks at Baku rise from the sea as well as from the land.

There is a legend in Russia now that these British were daring and rapacious, but Hagelin in his reminiscences tells a different story. "The British rode into Baku unsure of themselves, most timidly," the Swede recalls. "They couldn't find their way through the maze of local Caucasian life and politics. Somehow they failed to pick as their advisers and assistants good enough men from among the local leaders. Their officers and troops couldn't entrench themselves in this tumultuous country. The Azerbaijan republic, which the British tried to build here, was built on sand . . ."

And so the British withdrew. Into the vacuum, early in 1920, the Soviets marched triumphantly. The separatists of the Mussavat party fled to Tehran and Istanbul—that is, those who were not captured and shot by the Cheka of the Soviets. The Azerbaijan of the Caucasus became a Soviet republic. The oil fields were nationalized, with no payment to former owners. Some of the Nobels' best managers and engineers were asked by the Soviets to remain on their jobs as employees of the new proletarian state, but most of them —especially the Swedes among them—felt that this newfangled nationalization was plain robbery, and that it wouldn't work anyway. They declined to stay.

The Soviets went ahead on their own. Although the British had been accused of taking much oil out of Baku during their brief occupation, emissaries of the Kremlin found in Azerbaijan great quantities of petroleum stored in the years when Baku, cut off from the rest of the world by the hositilities, had not exported its precious fluid. Lenin's Russia, starved for oil, at last had plenty of fuel. The battered, neglected wells were repaired and put to work again. Workers and foremen were promoted to the jobs of mechanics and engineers to replace the old personnel that had either fled to foreign lands or had been shot for real or fancied sabotage of the oil fields.

The arm of Red Terror continued to weigh

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BAKU'S PROGRESS

The first oil well built in Baku in 1863 marked the beginning of one of the most spectacular petroleum developments in the world. Only two decades later the wells at the left were producing abundantly. Some of the oil wells of modern Baku are seen below.

heavily while Baku's modernization was decreed and carried out. During the Five-Year Plans of the '30s, tall office structures were built; a fine seashore boulevard was cut through; model housing came into being for engineers and workers. The very latest American oil-well equipment was bought for Baku's chief industry, but other industries were revived or introduced, too: metal works for making oil-well and oil-plant equipment and other machinery; sawmills and shipyards; flour and rice mills; factories producing cement, glass, tobacco, textiles, iodine and bromine. Trade with Iran, across the Caspian, was lively. Schools included a university, technical and teachers' colleges, a conservatory of music, and an academy of arts. Teaching, the theater, and the press were in the Azerbaijanian and Russian languages.

A mighty flotilla of tankers and barges carried the oil of Baku up the Volga River. Pipelines and railroads took more of the oil to Batumi, the Black Sea port, and to the industrial centers in the Don Cossack land and the Eastern Ukraine. On the eve of World War II, Baku supplied seventy per cent of Russia's entire petroleum.

This was what Hitler craved for his war machine as in the summer of 1942 he sent his panzer divisions slashing east, in the two-pronged drive toward Stalingrad and Baku. He might have won his objective, even if only temporarily, had he concentrated on just one goal: either Stalingrad or Baku. He came close to winning it as it was, and the Russians knew how near he was to victory. They prepared to destroy Baku if worse came to worst, rather than let the oil fields fall into Nazi hands in any half-workable shape. They were about to do as thorough a job of scorched earth as they had earlier done in the Ukraine and western Russia, with the coal mines and power dams, the factories and plants.

Hitler failed, but Baku suffered nevertheless. Production fell off because of wartime disruption. There was a lack of skilled engineers and mechanics, who had gone off to the fronts. There was a shortage of drilling equipment, of refinery machines. Seawater seeped into some fields because of the wartime lack of men and materials that used to keep the Caspian in check. The 1945 figure of Baku oil production stood at twenty-five million tons, or six million tons below the 1940 figure, and this at the time when the same war brought unprecedented increases in the oil production of other countries, most notably of the United States.

* * *

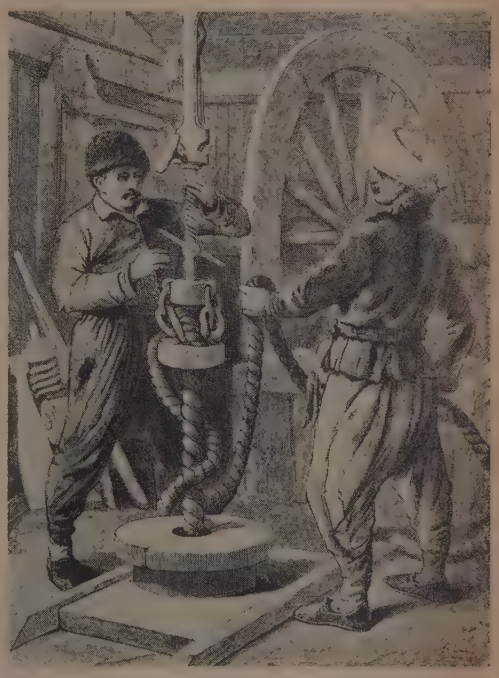
Greater damage yet was borne by the North Caucasian oil fields of Maikop and Grozny, some of which the Nazi divisions did succeed in penetrating. More than three thousand oil wells, normally gushing five million tons of precious fluid, were destroyed in the Maikop-Grozny Area.

Maikop was the first to suffer when in August, 1942, it fell to the Nazis. This meant the loss of seven per cent of Russia's oil production—and also deprived Soviet aviation of most of its high-octane gasoline. For, such was—and is—the chief value of Maikop oil to Russia: its high-octane content. Maikop flared up, a gigantic holocaust.

To the east of Maikop, the Wehrmacht approached the oil wells of Grozny, but failed

DRILLERS AT WORK

The nationalization of the Baku oil fields was one of the toughest problems the young Soviet Union had to solve. Engineers, administrators and workmen had to be trained, damages repaired and modern machinery installed. It was a herculean task but Baku's oil fields and refineries are today one of the more efficient industries in Russia.



OIL WORKERS OF THE EIGHTIES

Under the leadership of Swedish engineers and administrators the native workmen of Baku made the oil fields the most productive in the world. In 1872 the output was 16,400 tons; in 1883, 205,000 tons.

STALIN THE AGITATOR

During the early years of this century strikes were frequent in the Baku oil fields where the young Joseph Stalin was active among the workers as a revolutionary leader. He spent six months in the notorious Bailov prison, and after a second arrest he was sent to Siberia.

to capture them. Nevertheless, the nearness of the fighting and the treachery of some of the natives set fire to a number of these wells, too.

The name "Grozny" means "Terrible" or "Formidable." The town was founded in 1818 as a Russian fort against the Chechens, the fierce Moslem mountaineers of the Caucasus. Becoming a city in 1870, Grozy attracted French oil-exploiting capitalists in the 1890s. Later, British and Dutch investors replaced the French.

There was also an American oil-seeker from Titusville, Pennsylvania, who found his way to the Northern Caucasus in the 1880s. This was Almon Culbertson, of whose marriage with a pretty Cossack girl of the region Ely Culbertson was born, he of bridge fame and international peace projects. Born and reared in the Cossack land, Ely Culbertson once told me: "I am the only American of old Yankee stock who speaks English with a Russian accent."

In his remarkable autobiography, *The Strange Lives of One Man* (1940), among other exciting stories we read the episode of the discovery of some of the richest oil fields of Grozny by Ely's father:

"One day Father was talking to a Cossack who came from a village in the hills. The heavy rains had ceased, and a ray of sunlight was playing gaily on the Cossack's muddy boots. Father's attention was caught, and suddenly he stopped talking, pulled out his pocket knife, knelt down, and carefully scraped a little mud off the Cossack's boots. He began to scrutinize the mud with his pocket magnifying glass.

" 'Where did you get this mud?' Father finally asked.

" 'Where does a man get his mud, master? On the ground, of course!'

" 'But in what place?' Father persisted.

"The Cossack didn't know. Then began a most extraordinary expedition. Promising the Cossack a rich reward, Father immediately set out with him to retrace his steps to the village in the hills. Every so often, Father would stop to pick up pieces of mud."

And when Almon Culbertson finally reached the source of the magic mud, "these were the famous Neklepayefsky oil fields that later made Grozny the second largest oil producer of Russia." A very rich find, indeed.

The time was the late 1890s, and the oil fortune thus amassed by the Culbertsons' Caucasian branch was to last until 1920. Cancelled out by the Russian revolution, it was replaced by 1930 with another fortune, this one made in America, through contract bridge. In 1942 Ely Culbertson must have followed war communiqués with an especial interest and with no mean understanding of the map as in the summer of that year Nazi divisions were halted at the very edge of the Grozny fields.

The sharpest blow to Grozny predated the Nazi attempt by more than twenty years. It went back to the time of Russia's civil war of 1918-20, when six of Grozny's richest oil wells were set on fire by the Chechens and burned for one year and a half! And this, in its turn, was an aftermath of an earlier strife between these mountaineers and the Russians.

The first Russian attempt to subjugate the Chechens was made in 1785, and their final pacification dawned in 1859. As the tsar's armies advanced into the Caucasian foothills, its generals ordered the Chechens' villages destroyed, and their fields burned. In the areas thus vacated they settled the Cossacks of the Terek, cousins to the better-known Don and Kuban riders. Thousands of the defeated Chechens migrated to Turkey, but those who stayed at home waited for their chance to rise again. They saw their opportunity during the Russo-Turkish war of 1877-78. But as the Turks were vanquished in that war, so were the Chechen rebels put down once more. It was just then, that on their former lands around Grozny, oil was struck.

In time, many of the Chechen survivors fought well in the tsarist armies. Yet in another forty years, in 1918, these Chechen warriors recalled their grievances afresh. They demanded from the Terek Cossacks and other foreigners these and other lands. Battles flared and, with lulls, continued until 1920. At one time the Cossacks and other inhabitants of Grozny found themselves beseiged by hordes of Chechens streaming down from the mountains to seek revenge. Hurriedly the Cossacks and other Russians strung wire around Grozny, electrified it, and fought back. This was the battle during which the Chechens put some of the oil wells to the torch, the great conflagration lasting eighteen months.

The Soviet government, establishing itself in this region early in 1920, began a campaign of repression and reform. The wealthier Cossacks were deprived of their lands and other property, and sometimes of their lives. Many were imprisoned or exiled to Siberia. Oil lands and oil wells were expropriated. The Chechens and other natives of the poorer classes were given collective farms, schools, and other economic and cultural help. By 1936, feeling that the Chechens were satisfied and made into loyal citizens, the Soviet government began to return the local Cossacks into its official graces. This was, however,

(Continued on page 32)

THE FIRE WORSHIPPERS

The cult of fire worshipping in Baku was of ancient origin. The temples of the followers of this cult were filled with awe inspiring flames fed continually by the oil saturated ground.

THE GLORY OF ANCIENT INDIAN ARCHITECTURE

E. O. Hoppe

With photographs by the author

THE SEVEN PAGODAS

One of the most beautiful temples at Mamallapuram, or the Seven Pagodas, is known as the Shore Temple and probably dates from the eighth century.

THE PENANCE OF ARJUNA

Isolated rocks at Mamallapuram are carved with a profusion of human and animal figures. The great bas-relief called the Penance of Arjuna is ninety feet long and thirty feet high and probably dates from the seventh century. There are two life size, full grown elephants and four small ones. The rest of the rock is covered with human beings, lions, monkeys, deer, birds and religious symbols.

A SMALL PARTY of Buddhist monks wandered in pious search of peace and solitude. They hoped to find a place where they could settle and dedicate their lives to the contemplation of the eternal verities of the Gautama and prepare to enter Nirvana, the end of all sorrow. More than three centuries were to pass before another great religious teacher was to preach in distant Palestine. Some of the party had spoken with men who had spoken to men who had sat at the feet of Buddha himself and listened to the great new thoughts he gave out to a wondering audience.

Europe was then a barbarous hinterland to Attic and Roman civilizations. Egypt was decaying. Babylonia and Assyria were dissolving into the dust of Mespot. The Aztecs and Mayas flourished in cruel splendor. Man played a small part in the teeming wildness of North America.

At length the Buddhist monks settled at Sanchi in the state of Bhopal in the western part of India. Here they cut out of the Indian cliffs of stone the material for religious shrines which rank with the finest Buddhist monuments in India though they are largely ignored in favor of the better known structures at Ajanta, Ellora and Elephanta.

For a thousand years the work at Sanchi continued, the teaching and the building side by side, until lovely shrines covered every hill; convents for Buddhist nuns and monasteries for Bhuddist monks grew into universities to which came students and pilgrims from distant parts of India.

Why, and exactly when, the temples and hills came to be deserted is not known. With the passing of the centuries the number of devotees and pilgrims decreased. Eventually,

vandals descended upon Sanchi and took what treasures they could find.

Not until the early years of the present century was Sanchi again to have a change of fortune. A terrible plague broke out in the city of Bhopal and everyone who could fled the contaminated area. The queen moved her court thirty miles from the stricken city into the clean hill air.

During one of the long walks in which she delighted, the queen came across a mound overgrown with brushwood and tangled undergrowth. Her interest was aroused by great slabs of carved stone and not long afterwards the work of exploration and restoration was undertaken.

In the sandstone of the hills the ancient craftsmen had found ready to hand an enduring material which they had worked into stupas, portals, columns, all embellished with intricate designs of great beauty. The more important stupas were reliquaries enshrining in all probability either relics of Buddha or of some of his sainted disciples. Memorial pillars were erected by devout pilgrims as well as lesser stupas, some about a foot high. All these were dwarfed by the tremendous dome of the great temple of which only traces remain today. This was probably the central teaching place, covered with representations of the faith so that the doctrines of Buddha were pictorially clear to the pilgrims.

Dozens of intriguing legends can be pieced together from the wealth of elaborate detail carved on the pillars of Sanchi or on the gateways to the stupas which stand at the four points of the compass, marking the entrance to the processional way.

THE ROCK TEMPLE

Some of the temples at Mamallapuram are carved out of a single block of stone. Small, massive, finely proportioned and magnificently situated on a hill the Rock Temple is one of the most impressive examples of early Dravidian architecture.

A CARVED GATEWAY AT SANCHI

The stone gateways leading to the Great Stupa at Sanchi are remarkable achievements. Built on principles suited to construction in wood they have nevertheless survived for nearly two thousand years. Eighteen feet high and seven feet broad each gate supports a superstructure of three architraves. This picture shows the elaborately detailed carvings on the pillars which represent the stages in the Buddhist paradise.

CARVED FROM SOLID ROCK

The raths, or rock hewn temples, of Mamallapuram are unique in the whole of India. Here the stone cutters of the seventh century succeeded in carving buildings out of solid rock which resembled structures made of separate stones and wood. The largest measures forty-eight by twenty-five feet and rises twenty-six feet from the ground.

ON A FOUNDATION OF BASALT

The Nurudabund Temple at Mamallapuram is perched on the top of a huge basalt rock into the side of which a staircase has been hewn.

Symbols and figures adorn the top of one of the exquisitely carved arches at Sanchi.

The sacred Bodhi tree is a frequently recurring motif, since in every reincarnation Buddha's "seat of wisdom lay beneath its shade." The lotus blossom, from bud to full blown flower, is also a thousand times repeated, symbol of the enlightened one's birth and rebirth.

Naturally in so stupendous a work, ap-

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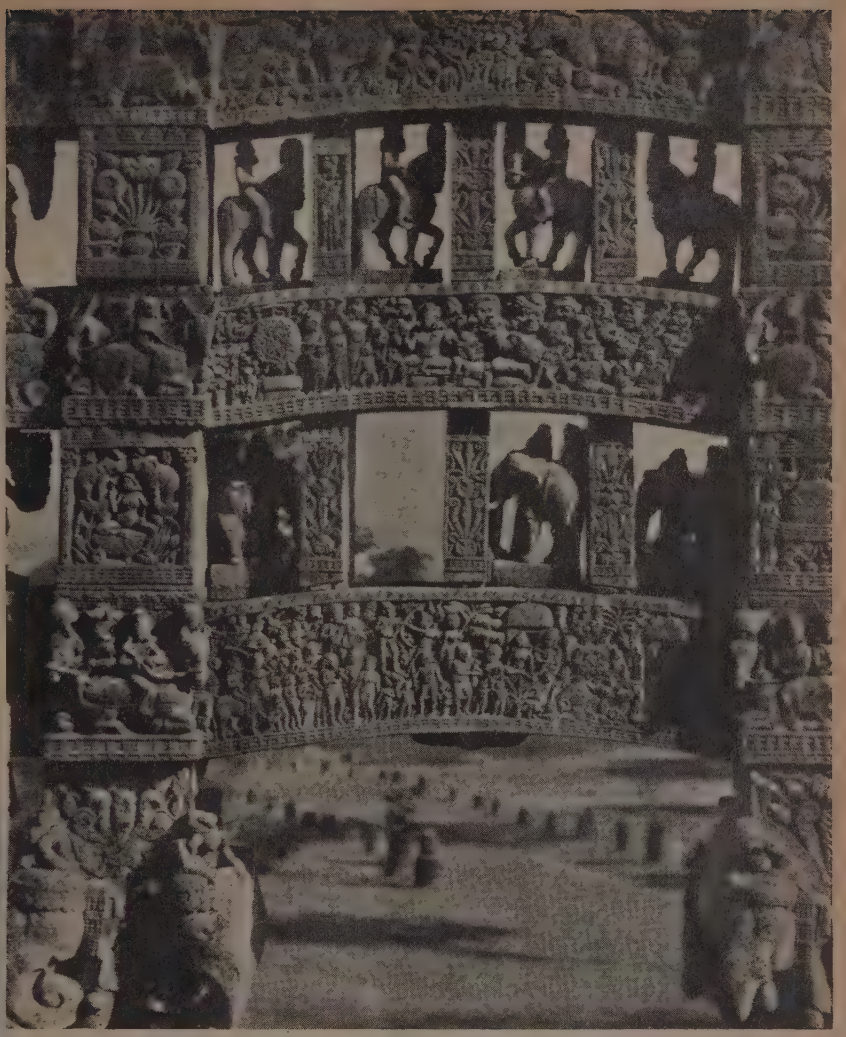

BUDDHIST PAGEANT IN STONE

This view of the stone architrave on one of the gateways at Sanchi shows more of the religious pageantry with which these sacred monuments are adorned. Images of horsemen and elephants are placed between the architraves.

ONE OF THE STUPAS AT SANCHI

There are scores of stupas of various sizes at Sanchi ranging in date from the third century B. C. to the twelfth century A. D. Stupas were erected by pious Buddhists as works of merit which would help the donors toward their religious goal.

SKY PLANTING IN THE DESERT

(Continued from page 8)

more jobs for many of our pilots.

To the seven thousand Papagos themselves, seeing their land grow green again will mean that their largest source of income is no longer in danger of being wiped out. Four thousand of them, more than half the population, are under seventeen. Family ties are strong with the Indians, and their children are well cared for. New life for the worn out range will mean economic security for their futures.

The hot desert lands of southern Arizona have been the home of the Papago for five thousand years. Overgrazing and constant use of the soil has made it more and more barren. In the shimmer of summer heat "dust devils" pick up loose topsoil and swirl it away. Against the blue desert hills boiling geysers of yellow dust rise to the sky. During years of drought the cattle grow thin and many of them die.

The Papagos receive no allowance from the government, and half their income from cattle. The land is owned by the tribe and cannot be sold; but certain acres have come to be recognized as belonging to one man.

Their vast three million acre reservation is almost entirely range land for the thirteen thousand cattle belonging to individual families. There is a tribal herd of four hundred registered stock, and family pride in the high quality of the cattle is strong. Rarely will a Papago sell a prized cow or horse to a neighbor, if he can sell it elsewhere.

Unlike some Indian tribes, the Papagos have gay, warm natures and a sense of humor. They are deeply religious, and the famous mission of San Xavier del Bac, near Tucson, which they built with back breaking labor in the seventeenth century, still stands as a historic landmark to their patient faith. It is the oldest cathedral in the country in which services are still being held.

The Indians are peaceably governed by their own council, made up of two elected delegates from each of the eleven districts of the reservation. These delegates, who work with the Indian agent, have powers vested in them by Congress.

Their reservation is known as the "Indian oasis in the desert." To the traveler entering it from the hot dusty road, the sudden sight of greenery is as refreshing as a long drink of water. With a "green thumb," hard work and little else, they have coaxed lawns and flowers to grow. Pepper trees, tamarisk and elms offer deep shade on the grassy parking in front of the modern hospital and agency office.

During midsummer the Papagos, famous as cattlemen and riders, go all out for a colorful two day rodeo. From far flung ranches and farms over the reservation comes a steady trickle of families, men and women and chubby, slant eyed children piled into horse drawn wagons.

The performers have been up since early morning, with horses groomed, saddled and ready. They spend hours checking ropes and saddles, and the air hums with excited chatter.

The colorful panorama encompasses a chequered pattern of cultures ranging from the ancient to the modern. Although they cling to many old customs, the Papagos are no slaves to tradition.

The women spend the morning playing the centuries-old tribal game of *taka,* a game resembling hockey in which two cow vertebrae tied together with a leather thong are used. In striking contrast, this is followed by a football game, played by the youngsters with the enthusiasm of a high school meet.

Paradoxically the dignified men and women arriving in their old fashioned wagons have a weakness for having their pictures made in the "take it while you wait" booths. Solemn Papago women in the billowing skirts and shawls of the last century seem to find nothing strange in talking to a slacks clad girl recently discharged from the WACS.

Since only about three hundred miles of road thread the whole widespread reservation, horses are the chief means of transportation, and the Papagos become expert horsemen. Their rodeo, complete with barbecue and candy apples, offers plenty of spills and thrills for the eager onlookers. The performers exult in the danger and exhilaration of wild bull riding and bronco busting.

With their natural flair for showmanship, they are especially fond of the calf-roping contest by teams. One man lassos the head, and the other the feet, of the steer. The team which throws and ties the cavorting animal in the shortest time is the winner. The horses are beautifully trained and the work is swiftly and competently done.

In the evening the whole family turns out for the cowboy dances, played by the Indians themselves and performed with great gusto. The Papagos are versatile and have assimilated American jitterbugging, as well as Mexican *paso dobles,* into their repertoire.

The influence of the war on the tribe was widely felt and of a lasting nature. Three women and 337 men joined the armed services, and for many of them it was their first experience off the reservation. Perhaps they will never return entirely to their old ways, but they face the future with confidence, as they always have.

Their grey and unproductive acres are but a microscopic portion, a tiny cross section, of what has happened or is happening to a total of 150,000,000 acres of public and private lands in the United States, according to estimates. Sponsored by the Division of Soil and Moisture Conservation, Department of the Interior, one hundred thousand acres of public domain in New Mexico and Arizona are being revegetized from the air. The project has Congressional support to the tune of $200,000.

Dr. Adams estimates that his method will save the government $1.60 an acre on revegetizing, and possibly as high as $11.50 per acre on reforestation. If he proves correct, this should mean tremendous slashes in the yearly government expenditude of three and a half billion dollars on soil conservation.

PRELUDE TO KOREAN INDEPENDENCE

(Continued from page 13)

The dawn of a new civilization radiant with the great ideas of humanity in past centuries shines upon the history of man. Spring comes anew to the earth and quickens ten thousand precious things. This new age contrasts with the past as does the renaissance of Spring, when all life expands in the warm sunlight.

"We, contemporaries with the new destiny of man, do not hesitate and do not fear. It is for us to regain the freedom that was ours; to enjoy all the happiness of life; to manifest our own creative genius and enable the budding thoughts of our people to bear their natural fruit out in the great Spring-filled world. . . ."

At this point the speaker paused. The crowd waited in expectant silence. Then it heard the word: *Mansei!*

The voice of the people broke like a crashing wave:

"MANSEI!"

It means "Korea live ten thousand years!"

From the pockets of many came Korean flags. My friends were soon divided from me, but I ran with the crowd and shouted as it did, "Mansei."

Pandemonium followed but there were not enough policemen to handle the crowd. They were aided, however, by the Japanese civilians who came out with swords and daggers and everything else they could find in their houses to use as weapons. A blow aimed at me hit one of the coolies behind me injuring him seriously. Then I was seized by a big iron hook in the hand of a mounted Japanese. The hook cut my neck, blood spilled over my clothes, and I was forced to get into the line with other prisoners. It was not till somewhat later that I felt the pain. At the police station I was put into a small cell with thirteen other boys. Many were badly wounded. One had his ear torn, another, his arm. There was no ventilation in that cell, and scarcely room for us to sit down.

About one in the morning I was called out before the examiner, with my hands tied behind me. I was kicked when I walked too slow. I was kicked when I walked too fast. Then I was kicked into the examiner's room. During the questioning I pretended to be stupid and ignorant. Then I was kicked and beaten with clubs resembling table legs. I fainted with pain. When I was revived with water I was asked more questions. By five A.M. my first trial was over. But later I was taken out again to the examiner and again beaten and questioned as before. That night the boys in my cell were given a handful of beans and a little water. This was our diet until, after several days, the Japanese released us, mere children, from a cell without washroom or toilet.

To crush this non-violent manifestation of August 19, 1910, the Japanese imprisoned fifty thousand Koreans, and killed seven thousand according to their own records. Many Koreans fled the country to continue the work for independence beyond reach of the Japanese; and to maintain secret contacts with underground organizations in Korea. One out of every five Koreans has been in exile at one time or another.

Many of these Koreans are returning home today, some from America as translators and interpreters for the American Military Government. Thirty thousand Koreans of Soviet citzenship re-entered Northern Korea with the Russian occupation forces. From Yenan, in China, came many of the Korean leaders of the Korean Emancipation League, in existence since 1944 for the purpose of sending organized bands to sabotage Japanese war industries.

Certainly no people on earth have been waiting more eagerly for the defeat of Japan than twenty-six million Koreans. When Japan surrendered there was happiness and hope for that little country of 85,000 square miles. Once more the Liberty Bell, the second largest in the world, rang out in Seoul.

I recently had a long talk with six Koreans sent to the United States by the American Military Government. Americans were good friends of Korea in earlier days and once signed a treaty of perpetual peace and friendship. American thought has inspired many Koreans to love democracy and to hate dictatorships.

The six Koreans told me that the people in Korea are determined to win complete independence, and they are waiting patiently, hoping America and Russia agree to withdraw their forces as soon as possible. The arbitrary division of Korea, along the thirty-eighth parallel, by the United States and Russia was originally made to facilitate military operations in crushing the Japanese. The continuation of this artificial wall long after the defeat of the enemy of United Nations is very unfortunate. It hampers the movements of goods and peoples, and the functioning of public services on a nation-wide scale.

Under the Moscow agreement, the two military commands are to form a joint Soviet-American Commission to solve immediate economic and administrative problems in Korea. We can only hope that this commission which has been working on the problem for some time will find means to do away with this artificial wall. Lieut. Gen. John R. Hodge, the American commander in South Korea, has reported: "The results of the work of this commission will prove the ability of two great nations of the world to cooperate fully in capitalizing upon their victory over oppression and despotism, and to restore a less fortunate, long oppressed nation to an independent sovereign status among the family of free nations."

These are very encouraging words to the Koreans from the American commander.

Nor is it a matter about which the rest of the world can be indifferent. Whether we are going to have another world war or not depends upon the cooperation between the United States and Russia. Neither China alone, nor Britain alone can create another world war. But Soviet Russia can; so can America. Thus the world peace depends on these two nations and there must be no serious conflicting interests in Korea which, though seemingly remote and insignificant, has great strategic importance.

NATIONAL TRAVEL CLUB BULLETIN

OBJECTS: to create and promote interest in travel and exploration; to furnish its members information of travel and secure concessions for them; to work for the betterment of transportation facilities; to arouse public interest in the conservation of our natural resources, the preservation of historic sites: the development of our National Parks and playgrounds, and of our waterways, the protection of our forests and our wild animal and bird life; to assist the good roads, safety first, city beautiful, and all movements that make travel safe and attractive; and to establish a closer relationship with the peoples of the world in order to secure the cause of international peace and justice.

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PHEASANT PARADISE

The most curious sight in South Dakota during the pheasant hunting season is that of a hunter coming off the fields without a single pheasant in his bag.

The reason is that South Dakota, particularly in the eastern section, has plenty of pheasants; it is virtually infested with them! Each year beginning with the last few days in September and continuing for about ninety days thousands of hunters from all over America swarm into the state, and there are few who bag less than twenty birds each.

The 1946 season should be an interesting one. During the war years hunting was limited because of restrictions on shotgun shells as well as travel. The birds, meanwhile, rapidly increased in numbers because of excellent crop conditions in corn and grain fields where the pheasants grew fat and sassy. How many birds there are in South Dakota today is difficult to estimate but they run into the millions. In 1941 alone more than three million pheasants were bagged yet they were apparently not missed.

Capital of the pheasant paradise in South Dakota is Huron, on the main line of the Chicago and North Western Railway from Chicago to the Black Hills. At Huron during the first week of the hunting season hunters arrive from every state in the Union. Distance means nothing because past experience tells them their trip here is never in vain.

It is nothing to see thirty or forty pheasants at one time either perched in trees or running down the furrows of fields. The pheasants are everywhere and the nearness of towns doesn't bother them just as long as they have fields and cover. So plentiful are they that farmers have in recent years found them to be a nuisance and generally welcome hunters on their land. The pheasants, incidentally, are the Chinese ringneck species.

HIGHWAYS FOR PERU

An asphalted surfaced road extending from Ecuador in the north through Peru to Chile in the south, is the promise of the Peruvian Public Works Department, which is devoting $80,000,000 during the next five years toward polishing up its highway system.

The more important projects scheduled for immediate attention are the following:

The Pan American Highway is to be completely asphalted from the border of Ecuador on the north to the border of Chile on the south, a distance of 1,823 miles.

The Olmus Highway — a new road which connects the coast with the headwaters of the Maranon River—is to be improved and extended.

The ocean to Amazon Highway, which extends from Lima to Pucallpa on the Ucayli River, is to be greatly improved and hard-surfaced in the section between Huanuco and Pucallpa.

The South Highway of Penetration, which is now being constructed from Cuzco to Puerto Maldonado—320 miles—is to be completed and hard-surfaced.

BUILDING LATIN AMERICAN AIRPORTS

Since the beginning of World War II, in excess of one hundred million dollars has been spent to make Latin American airports the most up-to-date in the world. Today they equal anything to be found in this country or in Europe for modernness of equipment, size and space.

Improvements have been completed on over fifty fields at strategic points throughout Central and South America. Among many locations benefited are La Guaira, Guatemala City, Belem, Natal and Sao Paulo.

Fields have been moved from congested areas, removing danger from high buildings, providing more space, and ultra modern night-lighting equipment has been installed making possible twenty-four-hour schedules. The latest in air navigation instruments and controls has been erected throughout Latin America to provide the most modern ground aids for aircraft.

New-type control-tower equipment is located at nearly every field with modern radio range towers throwing out beams. Fuel tanks are underground and runways are now of ample length (with some to spare) for any plane now flying or projected. Communications equipment is the finest available today. The aircraft flying in Latin America today meets with the best of facilities to be found today.

PROTECTING OUR WILD LIFE

Herds of elk aggregating 23,000 and mule deer numbering 20,000 are the most numerous wild animals roaming the nation's national parks under perpetual protection from hunters.

More than half of the elk are in Yellowstone National Park, a recent census revealed. The recently-dedicated Olympic National Park in the State of Washington contains 4,500 of the rare Roosevelt, or Olympic, elk.

Yosemite National Park in California's High Sierras has approximately five thousand of the twenty thousand mule deer and there is an even greater number in the mountainous Sequoia and Kings Canyon National Parks to the south.

Yellowstone Park also leads in the moose count with more than 600. Isle Royale National Park, Mich., situated close to the Canadian boundary in Lake Superior, is a close second with about five hundred moose, Glacier National Park, Mont., has about two hundred, and Grand Teton National Park and the adjoining Jackson Hole National Monument in Wyoming, about 130.

Practically all the mountain goats in the National Park System are found in Glacier National Park, Mont., with a count of 975; in Mount Rainier National Park, Wash., with 375; in Glacier Bay National Monument, Alaska, where they are numerous; and a few in Olympic Park.

Yellowstone also is first in the number of pronghorn antelope, with 800; of bison (popularly called buffalo) with 930; of black bear, with 450; and of grizzly bears, of which there are about 200. Wind Cave National Park, S. D., has the second largest park population of antelope, with 185, and of bison, with 269 of these great animals.

The herd of five hundred Dall sheep in Mount McKinley National Park, Alaska, leads the park bighorn population. This is a sharp reduction in numbers in recent years, from causes not yet determined. Yellowstone has 280 Rocky Mountain bighorns, Glacier 255, and Rocky Mountain National Park in Colorado, 125.

That busy engineer, the beaver, occurs in many wilderness national parks. There are about 1,650 of these interesting house and dam builders in Glacier National Park, perhaps as many in Yellowstone, and about 2,500 in Isle Royale.

The newest of the national parks, Big Bed, located in the Big Bend of the Rio Grande in western Texas, promises to develop into one of the most interesting wildlife areas in the National Park System. Peccary, white-tailed deer, mule deer, black bear, ringtail, gray fox, coyote, cougar, bobcat, beaver, and other species occur in this area. As domestic cattle grazing has been eliminated, improvement in the slow-growing desert vegetation has been noted and the gradual return is expected of many species of mammals and reptiles which had disappeared from the area or become rare.

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THE BLACK GOLD OF RUSSIA

(Continued from page 26)

more than a local measure and part of a national change of policy toward the Cossacks. By June, 1941, when Hitler struck at Russia, both the Cossacks and the Chechens were depended upon to defend their homeland against the Nazis. The Chechens in particular were counted among the true defenders of Russia, for was Grozny not the capital of their Chechen-Ingush Autonomous Soviet Socialist Republic?

But these mountaineers were a capricious lot. As the Reichswehr came within sight of their hills, many of the Chechens went over to the Germans. So many, in fact, that during the war Stalin's government declared the Chechen-Ingush republic traitorous and therefore dissolved.

* * *

No such disloyalty or other damage marred the other oil-producing regions of the Soviet Union. And there are many such regions, and more of them are being developed every year.

There are the fields on the opposite, eastern, side of the Caspian—at Krasnovodsk and Emba. North of that cluster of derricks, stretch the fragrant plains of Bashkiria, which merge into the gently rising slopes of the western Urals, the whole region known as *Vtoroye Baku*, or the "Second Baku," some of it already gushing black wealth, and more yet to gush. These are the rolling, hilly steppes of rich black soil and of intrepid Tatar horsemen. Time was when this countryside was famed only for its *koomys*, or mares' milk sold by Tatars to Russian vacationists. But now everyone brags about the figure of 365,200,000 tons—the estimate of the potential local oil wealth as announced by Soviet geologists. One such geologist boasted: "America's far-famed fields, particularly the oil fields of Texas, pale before the riches of our Second Baku."

Still farther north, near Archangel on the White Sea, the Pechora River valley yields its oil at Ukhta.

In the Volga region, the gas of Saratov is piped for the needs of Moscow across the flat chest of central Russia. In the Crimea, near Theodosia, oil has recently been discovered in promising quantities. In the Ukraine, near Lubny and Romny, another field is being developed. And there is new oil in the old Caucasus, too: in Georgia and Daghestan.

In the northwest of European Russia, the newly Sovietized synthetic, oil-shale, works of Estonia are being kept busy. In the southwest, the oil fields of former Galicia or Ruthenia, taken from Poland, are good producers. At Zistersdorf, Austria; also in certain places in Hungary; but above all at Ploesti and other opulent spots in Rumania, many derricks breathe noisily under the control of Moscow's representatives. For all these areas are now within the orbit of Soviet influence.

Oil was and is one of the chief underlying reasons for the new Soviet interest in northern Iran. When early in April, 1946, Moscow agreed to withdraw its troops from Iranian soil, it was in exchange for an oil concession north of Tehran, particularly in the rich province of Mazanderan where there is much oil, and of course in the Iranian Azerbaijan also, even though there is not too much oil in that troubled province.

Back home in the Soviet Union, most of Central Asia and Siberia are without oil, yet there are the fields of Sakhalin, also of Kamchatka; and Nordvyk on the Khatanga River of the Siberian Arctic coast produces fair amounts of petroleum. The oil of the hot sands of Russian Central Asia is brought forth mainly in the Ferghana Valley and Bokhara, those fabulous lands of fruit and cotton and rugs.

For its new and tremendous Five-Year Plan, and perhaps for other such plans yet to come, Russia needs oil and more oil. She has it, and will have it. The potential riches of "black gold" in that vast country are boundless.

MASTER BUILDERS OF THE AIR

(Continued from page 19)

eagles flew about—at some distance—voicing their disapproval of the intruder on their territory. When a turkey vulture flew near the birds, they both gave chase. Previously the eagles had been flying rather leisurely, but when the vulture came too near their nest, both birds speeded up their flight. The vulture was able to side slip and dodge his pursuers quite readily. Meanwhile the eagles forgot all about me, following the vulture for about half a mile in the opposite direction before returning to the vicinity of the nest.

During the hours spent in the blind on various days, I seldom had an opportunity to secure photos of the adults. Sometimes they remained away for long periods. Evidently the young birds were large enough so they did not need much attention on the part of the parents. And their food needs were taken care of so they did not need a new supply very frequently. One of the pair would make use of a dead tree to one side of the nest tree, where it would remain perched for long periods.

The actions of adults and young were interesting to watch, particularly when the young eagles exercised their wings as they stood in their nursery. No attempt was made to leave the nest, yet the youngsters flapped their wings repeatedly, long before the first flight was attempted. If young eagles left the nest the first time they tried their wings, as so many small birds do, they would be an easy prey for any enemies in the neighborhood. Instead, they exercise their wings for a considerable period while in the nest, so when they do leave, their wings are strong enough to carry them to a perch in another tree.

It takes about three years for bald eagles to acquire their characteristic mature plumage with white head and tail. Earlier in their lives their plumage is dark and it is sometimes difficult to identify a bald eagle at this time. It might easily be confused with the golden eagle. However, in Florida the golden eagle is rarely met with. When the bald eagle acquires the white head and white tail, it may be identified easily even when seen at a considerable distance.

The bald eagle's masterful flight is interesting to watch. These birds frequently visit cities and towns in the interior of Florida wherever numerous lakes or streams are present, and many Florida visitors have the opportunity to see them at fairly close range as they fly about over the water.

All too many eagles have been killed in days gone by. When an eagle was sighted someone was immediately tempted to try his marksmanship. If the gunner was successful, there would be an item in the local newspaper a day or two later, stating that John Doe had shot an eagle measuring so many feet and inches from wing tip to wing tip. Sometimes the victim was brought to a taxidermist—if there was one in the neighborhood—so the trophy of the gunner could be mounted and put on display. All too frequently the lordly bird's shattered body was discarded a few days later. Perhaps the wings might be nailed to the barn door as a reminder of the gunner's prowess. Now the bald eagle, our national bird, is protected by federal law, and some of the unnecessary slaughter has ceased. But as long as eagles roam over the countryside within gunshot, there will probably be many more of them killed, even if the event is not mentioned in the newspaper, as it used to be.

Despite its unpleasant characteristics the eagle possesses an undeniable majesty as it soars and circles on effortless wings high in the sky, or alights with outstretched talons in one of the great nests built in the branches of a tall tree. May these master builders of the air always be plentiful in Florida.

INDIANA'S OLDEST RAILROAD

(Continued from page 21)

sheet; too much stalled the locomotive. Today's freight cars are pulled up the hill by a modified type of engine equipped with vacuum brakes.

Surprisingly few accidents have been incurred on the cut. Once a car loaded with firewood got loose and crashed into a passenger coach. Among those killed was John Lodge, working for twenty dollars a week as the first railroad conductor in the state of Indiana. In more recent years a string of cars got loose and crashed at the bottom of the cut. A wrecker was called, which in turn got out of control and ended up at the top of the pile.

In 1853 Henry Ward Beecher, the famous evangelist, visited Madison. Joe Cravens, vice-president of the road at $3,000 per year, took the reverend gentleman by carriage to the top of the hill, that he might enjoy the "scenic grandeurs" of the locale at leisure. Then he invited him to coast down the cut on a handcar. If the ride became too fast for the dignified visitor's stomach, he was to raise his hand.

They began the downward roll. The wheels clicked faster and faster, the handles pumped like mad. The speed increased at a furious rate. Beecher looked startled, and gazed wildly at Cravens. The latter seized the brake lever. "Fast enough?"

Beecher, holding his black hat, replied in the negative. Cravens withdrew his hand. The car dropped sickeningly, and the minister raised a supplicating hand. Later he told friends that mortal man had never ridden faster than he at Madison.

Progress of the railroad northward into hog country entailed numerous hearings, conferences, legal engagements and bickerings. Often these arguments ended in threats and fisticuffs. Innkeepers, blacksmiths and livery stable men banded to protect themselves and their livelihood. They were vociferous in their warnings, and asserted that the railroad would kill both business and all its passengers.

One of the proponents working vigorously to secure the railroad was Colonel John Vawter of Vernon, previously a lot salesman in Madison. When surveyors ran the line directly through the colonel's new brick house, townspeople hooted in glee. But the iron-jawed Vawter merely moved his house, and the railroad went on.

The first stretch of completed roadway—between North Madison and Graham—was scheduled to be opened on Tuesday, November 29, 1838. High officials, including the governor and members of his cabinet, were slated to attend. Most important, a new engine was expected from Baldwin's, in Philadelphia.

This engine was scheduled to go by coast steamer to New Orleans, then northward by river boat. However, the coast steamer ran into a bad storm on the Gulf. The new locomotive, together with other heavy freight, had to be shoved overboard.

But the railroad directors were pork eaters of resolute stuff. Down in Louisville a dinky railroad variously called the *Louisville and Portland Railroad,* and the *Lexington and Ohio Railroad,* had been built, and promptly enjoined from operation by the courts on the grounds that it frightened livestock and was a public nuisance. The Madison people rented their engine, a nine- or ten-ton affair called the *Elkhorn.* This they ferried to Madison on a stone quarry barge. From the river docks five yoke of oxen, belonging to a man named Martin, hauled the engine up the vehicle route known as the Michigan Hill Road, and thence to North Madison, where it was installed upon the new tracks. To prevent damage to the flanges on the gravel road up Michigan Hill, stout oak timbers were staked at proper width to provide a wooden track. As soon as the engine moved forward a few feet, gangs of men pulled up the timbers behind, and staked them down in front. The entire rental project cost $1,052.00, but the dignitaries had their ride on schedule, and are said to have been amazed when the new train exceeded a speed of eight miles per hour at one point.

It was a year or so later, when things were not going well for the new road, that a "pep-up" banquet was held, and an intrepid speaker made the statement, "I venture to predict that the time will come when a man can eat breakfast in Madison, board our train, and have his supper in Indianapolis of the same day!"

Cutting firewood for the railroad became an important local industry. Farmers delivered split oak timbers in eight-foot lengths to wood piles adjacent to the tracks. During the winter men would gather with their bucksaws and cut engine wood. An important accessory was a fat bacon rind for greasing the bucksaw.

Wood burning engines were used until near the turn of the century. First rate white oak and hickory and maple made good stoking. But later the management cheapened, as one veteran engineer puts it, and at Madison a sawmill was installed to cut up old ties. These burned like flashwood, and in pulling up the famous hill, "it was worth your life to put your face out the cab, what with flames and red-hot embers pouring from the stack."

The principal source of revenue on the early road was hogs. Freight cars held from twenty-five to thirty fat hogs. Passenger trains for years took the sidings at way stations to allow the hog trains to pass. In 1852 the road delivered 124,000 fat porkers to Madison.

However, train rides soon caught the fancy of the people. Directors of the road quarrelled over the question of passenger versus pork traffic. For week-end excursions hog cars were sluiced out and fitted up with wooden benches from local schoolhouses or lodge halls. The concert given by Jenny Lind in 1851 was the occasion of several special trains, bearing music lovers from the state capital, which had no hall large enough to accommodate the young singer. Another time two or three directors conceived the daring notion of an excursion from Madison to Muncie. The railroad manager, a "man with little vision," opposed the excursion. The engine might break down, and Monday's hog trains be held up. But the directors prevailed, the engine did not break down, and the road made a thousand dollars clear on the excursion.

To people along the line the passing of a slaughter-house special on Sunday was an event. Often the train made connections with a river steamboat which gave passengers a ride up the Ohio and delivered them back in time to catch the northbound special.

At Vernon, where a mile-long crescent-shaped fifty-foot grade skirts the Muscatatuck Narrows, bets were laid as to whether the northbound excursion would get stuck. "If so, the engineer would then have to back up a mile or more," states an old-time resident, "and make a run to get through Vernon and to the top of the grade." So far as is known, this practice was unique in railroad annals.

Freight trains on this same grade used a lot of sand. Since too much sand might stall the train, the brakeman and conductor used to stand on the rear of the engine, and sweep the rails with a broom.

So tip your chair at a comfortable resting spot anywhere along the old branch line—the Muscatatuck Inn in Vernon, at Clifty in Madison, or on the bluff at Hanover—and the country will come to you. Should an old timer come up, it won't be hard to make yourself an authority on the subject—just as an example—of the old bell that hung in the cupola of the eight-sided station at Madison. It seems that if people were planning on taking the northbound train of a morning, they used to let the conductor know the night before. Then, for five minutes just a half hour before departure, the bell was rung. The passengers assembled, the conductor checked his list. If an ordinary citzen were late, the train might be held five minutes. But for the mayor, or people of importance, the train was held as high as thirty minutes.

Anyway, officials tried several times to discontinue the bell-ringing practice, but the citzenry kicked vigorously. In those days when the citizenus kicked, they got somewhere. So the bell continued to ring, decade after decade. And if it hadn't cracked in 1888 it would probably still be ringing.

* * *

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THE GLORY OF ANCIENT INDIAN ARCHITECTURE

(Continued from page 29)

proximately covering the years 350 BC to 600 AD, there is diversity of style. Foreign influences crept in, notably the old Assyrian heraldic form of the tree of life. The portrayal of beasts and birds departed from the life-like fidelity of the earlier sculptures and became mythical and imaginative.

At about the same time that the pious Buddhists settled at Sanchi another group of religious zealots came to the now isolated and sandy strip of southern India and established at Mamallapuram the architectural wonders which are now known as the Seven Pagodas.

While the style of Sanchi is basically Buddhist throughout, that of Mamallapuram indicates strong Brahminical influences, so that the principles of the Buddhists' and Brahmins' faith may be read side by side. There is nothing illogical in this for Buddhism at its inception was an offshoot of Brahminism and only gradually disassociated itself from the older creed.

It was here, at Chingleput on the Coromandel coast, that the sailors of the East India Company first came ashore to establish the white man's rule in the peninsula. Great, indeed, must have been their surprise when they found, almost buried in the desert sand, the finest examples of early Dravidian architecture in India.

It is a reasonable assumption that when Mamallapuram was a flourishing place of worship and accommodated thousands of priests and pilgrims the site was not the desert it is now. No sign of any secular life in the neighborhood remains. Only a few sparse palms break the monotony of the scene.

The main temples at Mamallapuram are certainly of later date by several centuries than those of Sanchi. Sanskrit inscriptions point to the fact that some of the craftsmen came from the north. The temples generally conform to the Dravidian style of architecture found in Southern India, but the enduring qualities of the granite —probably of considerable influence in explaining the choice of site—make it had to determine the exact age of the buildings which may be older than is estimated.

It is evident that much of the building at the Seven Pagodas was experimental, the craftsmen using stone but thinking in terms of wood. Thus, there is indication that they had their failures through underestimating the weight of the unfamiliar material. It would also appear that at one stage some disaster overtook the neighborhood.

What caused the abandonment of both Sanchi and Mamallapuram is not known. Natural, political and religious disasters must all have played their parts. Warfare must have affected them, even whim and fashion for rival holy places. But the Seven Pagodos resisted more effectively the ravages of man and climate, its granite was more durable than the sandstone of Sanchi.

Mamallapuram, Sanchi—both sleep on the memory of their past glories. Both, in their present beauty, tell us of the artistry that flourished in India when the inhabitants of England, hideous and woad-painted, held savage festival in the primitive mightiness of Stonehenge.

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THUNDERING HERDS OF PREHISTORIC AMERICA

(Continued from page 16)

looking, and seemed fascinated with bright objects. Upon missing several things, including my best awl, I discouraged his company and he hit the skyroad for other skullduggery.

The birds were always cheerful, all but the big black buzzard that circled ominously overhead—waiting for me to die, presumably of the heat.

His vigil was in vain. Our eden was doomed. Bulking white billows pushed above the treetops. A gray wall of storm rose and moved across the sky to the rumbling tempo of thunder. Something sucked the air from the river-bottoms; the wind was stilled, the animal voices hushed; the forest caught its breath and the marshes stank. Over the quiet earth spread a livid, sulphur dusk—unreal and weird.

Suddenly, blasted by thunder and riddled by lightning, the wall of cloud collapsed—releasing a torrent of rain.

Jonah emerged from the belly of his fossil whale and made for the ark—a battered black Packard parked under the bridge. From there to high ground and a snug dry cabin in the pines.

It rained as only it can rain in Mississippi in the summer. Days later when it was over and long shafts of sun filled the dripping woodlands, I returned to my specimens.

They were gone! The river, swollen with the overflow of a thousand tributaries, had spread havoc along the shores. There wasn't a vestige of bone, only swirls of sand and mud left by the receding flood.

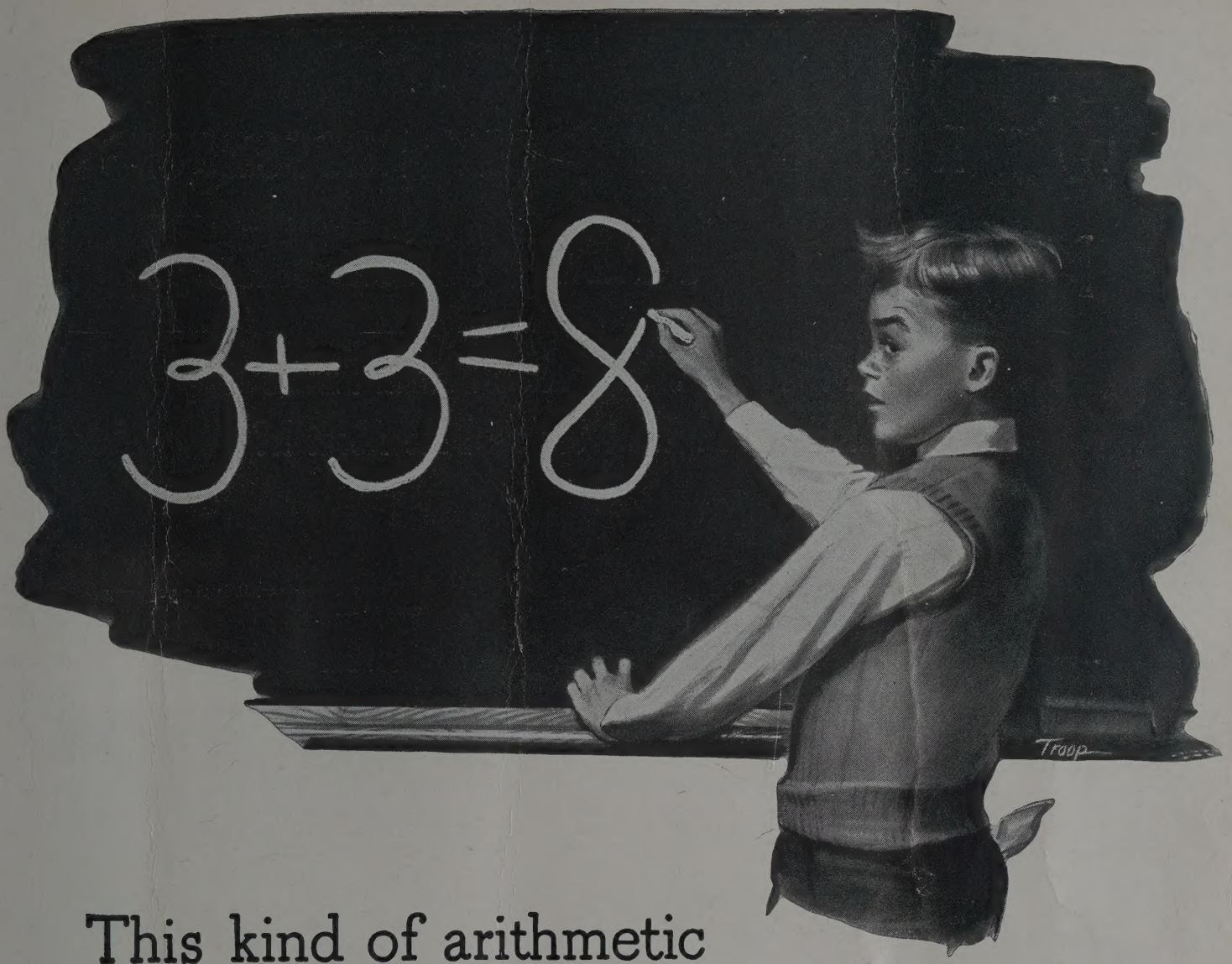
Had the earth reclaimed its own? Had my whales, swept up by the current, returned again after forty million years to their watery element and a new grave on the bottom of the Chickasawhay? The answer was as clear as the Mississippi mud. Time alone would tell.

Days passed. The river banks steamed and the baked mud cracked and peeled.

There beneath the dried blanket of silt were my fossils—still intact and none the worse for their brief encounter with the elements.

Call it bone-hunter's luck, if you will. The ways of nature are hard to fathom. In any case, she cannot be said to relinquish her secrets easily.

When hunting fossil whale, anything can happen—and usually does. It is well to go prepared with the adaptability of Jonah, the patience of Job, the foresight of Noah . . . and a spell of good weather.



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SAVE THE EASY WAY... BUY YOUR BONDS THROUGH PAYROLL SAVINGS

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Why must sleeping car passengers put up with "rolling tenements"?

9 Out of Every 10 Sleeping Cars Now in Service Belong in Museums! What Can Be Done About It?

ANYONE who ever takes an overnight train trip owes it to himself to read these facts:

The average age of the 6,800 sleeping cars now in operation is almost 22 years. Nearly 25% of them were built before the first world war. (Would you expect a comfortable ride in an automobile built between 1910 and 1915?)

Compared to really modern sleepers, these old cars are as out of date as high button shoes! And to ride in these jittering tenements on wheels, 25 to 35 years of age, the traveler pays a premium fare. Is it any wonder railroads are losing business to the airways and the highways?

What's the Reason?

Don't think this situation is due to the war. It existed long before the war. Only 900 sleeping cars—a mere 13% of those now on the rails—were built in the last 16 years, and less than 9% are of modern lightweight design.

With over 6,000 new sleepers needed, only 764 had been ordered as of June 1. These were ordered in small lots of varied design by 25 big railroads for their own use. (More than 30 other roads that operate sleeper service did not have a single sleeping car on order!)

Not only does this piecemeal method of buying mean that the new cars will be ill-fitted for through service; it is one of the principal reasons why they will cost four times as much per pound to build as an automobile.

Since last September, the C & O has tried in vain to get other railroads to agree on sleepers of standardized designs and to place sufficient orders so that all railroads can gain the economies of mass production.

Our efforts have been given no encouragement. We are tired of waiting and so are the travelers we serve. Apparently, the only way the C & O can get modern sleepers is to have its own built!

We Will Wait No Longer!

We of the C & O lines will not sit by idly while our night passengers travel in outdated rolling tenements. We are now inviting bids from manufacturers on enough modern sleeping cars to replace every sleeper on our lines, with a substantial margin to spare.

We have taken this step, independently, with great reluctance. To supply our own sleeping equipment, it is necessary to buy not only enough cars to meet our routine requirements — but with no pool of modern equipment to call upon, we must also provide for seasonal and other peaks.

This is not the most economical way to secure modern sleeping car service. But, as far as we can see, it is the only way open to us.

The C & O Repeats Its Offer!

The present situation is plain bad business. People want modern equipment. They have shown themselves eager to travel on the railroads that provide it. Even before the war, new lightweight streamliners were packed to capacity on routes where their old-fashioned predecessors had traveled half empty.

The demand for travel accommodations has never been greater than it is today. Yet ancient sleeping cars still clutter up the rails while the airways and highways shine with new models. It doesn't make sense!

The need is self-evident for an efficient, new sleeping car operating company which can and will buy modern cars competitively in quantity and service them economically. The past record of America's only sleeping car operating company offers little encouragement that it will fill these needs. We will gladly release all the new cars we purchase to any independently operated pool that will demonstrate an interest in making modern sleeping car equipment available to all railroads, at reasonable cost. If the other roads will do as much, it should be easily possible to attain this objective.

What roads will co-operate in this drive to give the traveler better service at lower cost?

The Chesapeake and Ohio Lines

Terminal Tower, Cleveland 1, Ohio

CHESAPEAKE AND OHIO RAILWAY
NICKEL PLATE ROAD
PERE MARQUETTE RAILWAY